AN
ATTEMPT
Towards a
Natural History
OF THE
FOSSILS of ENGLAND;
IN
A CATALOGUE of the English Fossils
in the Collection of
J. WOODWARD, M. D.

Containing
A Description and Historical Account
of each; with Observations and Experiments,
made in order to discover, as well the Origin
and Nature of them, as their Medicinal, Mechanical, and other Uses.

PART I.
Of the FOSSILS that are real and natural:
Earth, Stone, Marble, Talcs, Coralloids, Spars,
Crystals, Gemms, Bitumens, Salts, Marcasites,
Minerals, and Metals.

TOME I.

LONDON:
Printed for F. FAYRAM, at the Royal Exchange; J. SENEX, in
Fleet-street; and J. OSBORN and T. LONGMAN, in Pater-
oster-Row. M.DCC.XXIX.
THE
Publisher to the Reader.

DR. Woodward has been so full in his Prefaces to these Catalogues, and in his Dissertations on the several Parts thereof, that he has made it in a manner needless to say any thing more about them.

It may be, however, proper to observe, that the Catalogue of the first Tome of the English Fossils, in the Cabinets A and B, contains an Account of such as the Doctor bequeathed by his Will to the University of Cambridge; and that the English Fossils in the Cabinet C, and the Foreign ones in the Cabinet D, described in the second Tome of the Catalogue, are those which He has ordered to be disposed of, and are now to be sold.

Both these Collections are not only extremely choice and curious, but (what is more surprizing) are compleat in their kind. They contain each of them a great Variety of all sorts of Fossils; especially the Latter,
which the Doctor procured from all the known Parts of the Globe, with a Trouble and Expence more than sufficient to discourage any other body from attempting a Work in which he so happily succeeded. He succeeded indeed, but it was not without having carried it on for a Course of near forty Years, with a Passion for the Improvement of Natural Knowledge in general, and with a particular View to evince the Universality of the Deluge; which they prove, indeed, by ocular Demonstration.

A Collection of English Fossils, if a Man uses a proper Diligence, and will not scruple the necessary Expence, may possibly be made in the space of eight or ten Years; but to make such a Collection of Foreign Fossils, as are exhibited in these Catalogues, will require an Age, and is not to be done without an universal Correspondence, and an inconceivable Expence. This is necessary, whatever the Exemplars are; but to make a Collection of such choice and curious ones as these, requires likewise an exquisite Judgment, not above one in ten, perhaps, of the Bodies collected having been admitted by the Doctor to make part of it, whilst the rest were rejected for being defective in something requisite to render them fine Exemplars.
Tis really amazing, how, amidst the continual Business of his Profession, and a Variety of other Avocations, he could find time to maintain all his Correspondencies, collect so fine a Library, and so vast a Number of Fossils, finish so many Pieces as he has printed and left in Manuscript, and make himself Master of so many different Sciences. Nothing can account for it, but his constant and unwearied Application to his Studies, which took up all the Time that he could call his own; and which he pursued to the last Moments of his Life, for several Months that he was confined to his Bed, with uncommon Affiduity and Success; he having wrote his Method of Fossils during that Space, and being actually engaged in the printing of it at the Time of his Death.

This was a Work exceedingly wanted in the World, yet scarce ever attempted, and never executed before. Few or none, indeed, were equal to it; nor could any body have been qualified for it without a long Course of Enquiry, and accurate Observations, and such a thorough Insight into the Nature and Kinds of Fossils, as enabled the Doctor to methodize them according to their several Species, and reduce them into
a Science. We may now justly expect considerable Improvements in the Knowledge of this Part of Nature; and the Method, which he has publish'd, will make these Catalogues exceeding useful, and serve for a Direction to any one that has a Gout for the like Studies, and is determin'd to make his Collections with such a Choice, and his Observations on them with such an Accuracy, as may render them most instructive to himself, and most beneficial to Mankind.

As these Catalogues have been printed in great haste, 'tis not impossible but the Reader may find in them several Errors of the Press, which he is desired to excuse, and ('tis hoped) will easily correct.
NOW, that I have been for some time engaged in Mineral Studyes, with no small Application, 'tis a Pleasure to me to find that it has not been wholly without Fruit. One Sample of which I gave in my Essay towards a Natural History of the Earth; which met with so favourable Reception from the Publick, as to give me great Encouragement to proceed. I had indeed, before ever that Work was set forth, drawn up some others in pursuit of that Design: and have since added several more; to which I shall now subjoin the following, which exhibits an Attempt towards a Natural History of the Fossils of England.

This noble and happy Country is extremely fertile, as of those above, so likewise of its Productions under Ground. These it yields in great Number, and Variety: and many of them of extraordinary Excellence, Worth, and
and Use*. Nor are there perhaps many, that, either by my own Searches, or the Diligence of my Friends, I have not procured Specimens of. There is indeed in this Collection, the far greatest part, if not all those that have been recounted by Writers: and a great Number more that have never been, either described, or so much as mention'd. Not but that this, and indeed every Attempt of this kind, must needs be defective, the Stores of Nature being endless and inexhaustible. Nor can it be suppos'd that the Accounts of the Bodyes, here exhibited, are every where complete, or all the Descriptions of them full and perfect. But any other Man, who shall have Leisure and Encouragement to pursue this Design, will here find Land-Marks and Notices sufficient to conduct himself by, in that so useful a Pursuit.

In order to the forming a better Judgment in this Affair, and making some Estimate of the Bodyes set forth in this Volume, I shall lay a brief Summary of all the several Kinds of them here in view.

* See several Instances, p. 2. & 3. infra.
So great a Variety as fifteen hundred Bodies, and upwards, and each so much differing from other, that in the whole there are scarcely any two alike, in every respect, to be produced within the Bounds of one Country, must needs be allow'd to be very considerable.
siderable. All these I have endeavour'd to reduce to Method: and, where the Bodyes were capable of such Distinction, cast the various Kinds, with the subordinate Species, into Classes; according to their mutual Alliances, and their Relations to each other.

In ranking of them, I have founded my Judgment wholly upon their Nature and Properties, so far as the most rigorous Examination, and the exactest Experiments I could make, laid them open to me; not neglecting, in the mean time, such Notices or Intimations as were given me by their Figure, and exterior Appearance, or any other Phenomena of them.

The History, of the greatest Part of these Fossils, is here deliver'd a-part; together with an Account of the Place where every one was found. I should have been glad I could, in each, have also set forth, what I have of several, at what Depth, and in what Manner it lay: among what Matter it was reposited; as also in what Plen¬ty; along with all the other considerable Circumstances of it. This is follow'd, as far as my other Affairs would permit, by particular Observations upon the Body itself: upon the Colour, the Bulk, the Form, the Texture, the Constitution, the Purity or Mixtures dis-
discernible in it; and whatever else occurs worthy of Notice and Remark. Next is set forth the Result of the Experiments, that have been made upon the Body, in order to discover the natural Disposition and Properties of it: its various Medicinal, Mechanical, or other Uses: and the several sorts of Metall, or other Matter that constitute it, or are contained in it. In fine, upon these Histories, Accounts, and Observations, are founded several Reflections and Inferences relating to the Origin and Formation of the Body: as also to both its past and present State and Condition.

This Method I have made choice of as the most plain and simple of all others: and consequently the least liable to mislead me. The exterior Circumstances of many of the Bodyes, while in the Earth, where they are deliver'd, 'tis done with real Care and Faithfulness: and none the least Particular omitted that might give any Information or Light into the Natural History of each. As to the several Phenomena of the Bodyes themselves, they are at this Hour extant: and apparent in every single Individual thorough the whole Collection. And for the Experiments, they were all made with the utmost Exactness and Circumspection; besides, that several of them
them were repeated more than once. Now the Reflections, that are everywhere inter-
spersed, being founded entirely upon those Cir-
cumstances, Phenomena, and Experiments, are in truth so many Deductions from them: and therefore as much Matter of Fact as Those are, and to be rely’d on with equal Cer-
tainty. This is evident at first View: and so incontestible, as to leave no Room for a Man of Understanding to doubt of it. Nor do I see any reason to call in question either the Modesty or Judgment of those who think Natural Truths, when pursued in right Me-
thod, capable of being brought to the highest Stability and Demonstration. I only wish I could say, All, who have wrote upon natural Subjects, had pursued that Method: and that both their Observations, and their Rea-
sonings upon them, had not given too just cause to the common Declamations of the Uncertainty of these Studyes. Then again, Some there have been who have reasoned happily and successfully enough upon the Ob-
servations they have made; but Those have been too few to make any general Conclu-
sions from: and of Extent and Strength not near sufficient to bear the Bulk and Weight that they have been charged withall. I am far from going about to offer now a
complete Theory of any of the Subjects here set forth; yet it may not be unseasonable to remark, that none of the Deductions are made from single, or a very few, Instances. The Bodies presented in most of the Classes of this Catalogue are very numerous and various: and found frequently in Parts of the Kingdom, very distant from each other; not to enter here into a Detail of the Particulars of the Catalogue of the Foreign Fossils, which exhibits Samples from even the remotest Parts of Europe, from Asia, Africa, and America; in order to the carrying on the Natural History of Fossils quite round the Globe.

I know well there are Those who would have the Study of Nature restrain'd wholly to Observations; without ever proceeding further. But due Consideration, and a deeper Insight into Things, would soon have undeceived and made them sensible of their Error. Assuredly, that Man who should spend his whole Life in amassing together Stone, Timber, and other Materials for Building, without ever aiming at the making an Use, or raising any Fabrick out of them, might well be reputed very fantastic and extravagant. And a like Censure would be his Due, who should be perpetually heaping up
of Natural Collections, without Design of building a Structure of Philosophy out of them, or advancing some Propositions that might turn to the Benefit and Advantage of the World. This is in reality the true and only proper End of Collections, of Observations, and Natural History: and they are of no manner of Use or Value without it. 'Tis indeed what all intelligent Men would much rejoice to see prosecuted, not only thorough the Mineral Kingdom, but all Parts of the Universe; for the Honour of the great Author of all Things, the Enlargement of our Minds by the Discovery of useful Truths, and the common Good and Interest of Mankind.
THE

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**CLASS I.**

**EARTHS, and EARTHY SUBSTANCES.**

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Sect. I. Earths that have more or less of an unequious Smoothness and Softness to the Touch.

Art. 1. Those that adhere to the Tongue, if apply'd to it.

a. 1. Cimolia, of a dark lead Colour. This is found near Northampton, and used there for making Tobacco-Pipes.

a. 2. Another Tobacco-Pipe-Clay, of a whitish or very light grey Colour. From Pool, Dorsetshire, Cimolia alba. Dr Wynnebanch, in a Consultation for the famous Mr. Thomas Papilion in a Fever, told me the Cimolia alba was one of the chief Arcana of Sir Theodore MAYERNE in both intermittent and continuous Fevers.

a. 6. Argilla, Clay, of a pale Ash-Colour. From Thurston, Northumberland. The Bed of it is about 3 Foot thick, and lies under several Strata, and particularly one of Coal. 'Tis used for making the Pots employ'd for melting the Glass-Metal at Newcastle: endures the Fire to admiration, and is probably the best for that purpose of any in England.

a. 10. Fullers-Earth, of a grey Colour, with a Coat of greenish Yellow. From Wooburn in Bedfordshire.

a. 11. Another Sample, little different, only the Colour is somewhat darker. From Detling, near Maidstone, Kent. This Fullers-Earth lay 33 Foot deep; the Stratum of it is about a Foot thick. Immediately over this was the Stratum of the following Fullers-Earth, a. 12. which was about five times as thick as the Stratum of this. Above that was a Stratum of Loam, abounding with Sand 25 Foot thick, and over all a Stratum of common vegetable Mould about 2 Foot thick. The Workmen sink for the Fullers-Earth in several Places in the Ground all round, and find the Strata of Mould, Loam, and Fullers-Earth every where lying in the same Order, and of much the same Dimensions with those.
those set forth above. In the Loam they find Variety of Sea-Shells, Oysters, Cockles, and the like: as also River-Muscles; which they do likewise sometimes in the Fullers-Earth; but those in this last are generally much rotten and decay'd.

a. 12. Another, of a dark grey Colour, approaching to black. From the same Pit.

Fullers-Earth is a thing of great Service and Importance. 'Tis a Property of it to imbibe Oyl, Grease, and other unctuous Substances; and the great Use that is made of it, is for the cleansing of Woollen-Cloth. Every body knows how frequently Tar is employ'd, as also Tallow and Grelè, in the external Affections and Diseases of Sheep. Nor can the Wool be work'd, or made up, without being first greased or oiled: All which unctuous Matter must be taken forth again out of the Cloth before it can be worn. Nor is any thing yet known so serviceable to that purpose as this Earth. And as the Fullers-Earth of England is very various and copious, so it very much exceeds any yet discover'd abroad in goodness. Which indeed is one great Reason why the English surpass all other Nations in the Woollen Manufacture: And, to preserve and secure this to the Country, the Exportation of English Fullers-Earth is restrain'd by Act of Parliament. This Earth is one illustrious Instance of the Pre-eminency of our Soil, and the Excellency of the Productions of the Earth of this Kingdom above most others. Another Instance we have in Wadd, or Black-Lead, a Mineral of great Use and Value: Nor is there any of worth yet found out in any part of the Globe besides. The Amber and Jet of England are found in considerable plenty, and are much finer than any I have seen from abroad. Even our Canal-Cole nearly equals the foreign Jet. Nay, the common Cole is infinitely superior both in Goodness and Quantity to any got elsewhere. There are in this and the following Class, various Instances of the Pre-eminency of the English Earths, the Gravels, the several sorts of Stone, Slates, Flags, and other Bodies that are fitted to various Purposes, and are of mighty Importance in great variety of human Affairs. As are also Vitriol and Alum, which are found in greater plenty here, than in any other Country; infomuch, that we can sell them cheaper than Foreigners can. Then the Tin found in that one County of Cornwall, to lay nothing of the Excellency of it, is superior in Quantity to all that is got in the whole World besides. The Lead-Ore of England yields a great share of Metal, and is found in greater abundance than in any other Country; besides, that it runs kindly in the Fire, with less Trouble and Expence, is better, softer, more ductile and fit for use than the foreign Lead. Which yet does not arise from any Peculiarity in the Metal; for Metals of the same sort, when reduced to an equal Purity, are alike, in all respects, in what Country soever they be got: but because the Spar, and other extraneous Matter,
Matter, incorporated with the English Lead in the Ore, happens to be of such Nature and Disposition, as to be wrought upon easily and freely to part from it. For the other Metals, Copper and Iron, England likewise affords them in great plenty: and several sorts of their Ores, not understood in former Times, have been now lately discover'd by the Diligence and Curiosity of the Searchers into Nature here. To the same Diligence are also owning several Methods of melting and working Ores, that are not only new, but far surpass any that ever were in use in foreign Parts, both for Convenience, Cheapness, and Expedition. As to Gold and Silver, England affords both, and in greater Quantity too than is commonly imagined; which several late Trials have taught me. Then we have Carnelions, Agates, Mochoes, Onyx's and Jaspers: as also Topazes, Emeralds, and Saphyres, tho' they are not so hard as the oriental. The Diamond indeed we want, and some few others of the Gem-kind: But, excepting these and Cinnabar, which is the Ore of Mercury, I know no Metal, Mineral, or Fossil whatever that England does not yield; so very fertile is it, and happy in its Productions under ground, as well as in those above, and in its Clime and Situation; its Laws, Government and Constitution.

Artic. 2. Those that will not adhere to the Tongue.

a. 16. Clay, of an Ash-Colour, very smooth and fine, and adhering slightly to the Tongue. It abides the Fire well for several Days, and serves for the making the Pots that are used for the incorporating of Calamin with Copper, in order to the making of Brass. 'Tis got at Cheame near Epsom, Surrey.

a. 20. Steatites, white, with Veins of red. From the Sope-Rock, Cornwall. A considerable Part of the Cliff near the Lizard-Point consists of this Earth. From several Tryals that have been lately made for the baking and making this Earth into Pots, I am satisfy'd that 'tis not much inferior to that of which the Porcellain is made, and that the Pots formed of it would be near as fine, did our Potters understand the Ordering and Management of it so well as the Chinese do.

a. 21. Steatites, spotted, veined, and variegated with red and white like a Marble. From the same Place.

a. 22. Steatites, much like the foregoing. 'Tis found among the Iron-Ore at Langron, Cumberland. 'Tis very much harder than when first taken out of the Earth, it having then a Consistence not much more firm than that of Tallow.
Sect. II. Earths that are more or less dry, and harsh to the Touch.

a. 30. A Dusky grey Earth, become very hard since it was dug up. Found near Sturbridge in Worcester-shire. Of this they make the Pots in which the Glass-Metal is melted in the Furnaces. If they are well made, they will endure a very intense Fire for three or four Months.

a. 31. Another-like Earth, but rather paler, used for making Bricks for the insides of Furnaces, at the Lord Derwentwater's Lead-Works near Haden-Bridge in Northumberland.

a. 32. A light brown Earth, become now very hard. 'Tis used for polishing, and call'd by the Workmen Rottenstone.

a. 33. An Earth of an Ash-Colour, very fine. Sherborn, Gloucestershire.

a. 34. A whitish gritty Earth, sent by Mr. Morton with the Title of Calx nativa. It makes an excellent Plaister, or Cement, mix'd only with Water, without previous burning. From Clipston Stone-Pit in Northamptonshire.

a. 35. A loose Earth, very fine, of a brown Colour. Found in Wooky-Hole, near Wells. 'Tis used by the Silver-Smiths for Cafting.

a. 36. A loose Earth, of a pale green Colour. Found adhering to the Sides of the great Copper-Vein at Goldsculp, Cumberland, being brought by the Water which is perpetually trickling down those Sides. This is the same with what is called Terre verte, and doubtful owes its Colour to an Admixture of Copper.


a. 38. A like Earth, but of an azure or bright blue Colour. Found together with the former, and used by Painters by the Name of Lambert's Blue. This is the same with the Lapis Armenus of the Shops, and owes its Colour to an Admixture of Copper.

a. 39. A loose Earth, of a pale flesh-Colour, i.e. white with a blush of red. Found in small Fissures of a brown soft Stone in the Skrees, a Mountain in Cumberland.

a. 40. Chalk, from Greenhyth in Kent. Fine clean Chalk, is one of the most noble Aforbents I know: and most powerfully corrects and subsides acrid Humours in the Stomach: tempering and allaying the Emotions and Ebulitions of them. This property is what renders it so very serviceable in the Cardialgia, or Heartburning; an Affection of the upper part of the Stomach caused by the ascent of hot acrid corrosive Steams: and in Diarrhoas or Fluxes. In the Heartburning, the common People dissolve 2 s or 3 s of it in a Glass of Spring-Water, which seldom fails of giving them Relief. Indeed I my self have known it, in some
of the most obstinate Cases of this kind, succeed very happily, where Crabs-Eyes, Pearl, the cretaceous Matter in Oyster-shells, and the other Tertiary Absorbents, availed little. Nor is it less helpful in Diarrhoeas. Those who frequent the Sea, and are not apt to vomit at their first setting forth, fail frequently into Loosness, which are sometimes long, troublesome, and dangerous. In these, they find Chalk so good a Remedy, that the experienced Sea-Men will not venture on board without it. They chiefly make use of that which is contain'd in the Shells of Echinus Marini; which indeed is usually very fine and pure. These are dug up very commonly in the Chalk-Pits on each side the River, at Purfleet, Greenhithe, and Northfleet, where the Chalk-Cutters drive a great Trade with the Sea-Men, who frequently give good Prices for these Shells, which they call Chalk-Eggs.

a. 61. A loose white Earth, light, and very fine, part of it concreted into little Lumps, and part in a mealy Powder, found in the Slate-Quarry at Colly-Weston, Northamptonshire. This is the Lac Lune of Dr. Plot and other late Writers.

a. 65. An Earth, very fine, and light; almost of the consistence of Chalk; but of a dark brown Colour, with a cast of Yellow. 'Tis a sort of Umbre, found plentifully in a Vein of Lead-Ore, the same in which the crystalliz'd Ore, a. 120. was found, in Arkendale, Yorkshire. I never saw of it elsewhere. Vide a. 76. & 77. infra. The Earths that are found in Strata, are commonly mix'd, foul, coarse, and gros; but this Umbre, the yellow Ochres, a. 76. & 77. and the red Ochre, a. 90. consist of Matter extremely small, subtile, and even impalpable. Indeed, being found in the perpendicular Fissures of the Strata, it could not be otherwise; for all the Matter that compotes them, must have passed the Pores of those Strata, before it could arrive at those Intervals; which it could never have done, had it not been very subtile and fine. This Constitution of these Earths, renders them far above all others fit for Colours for the use of the Painters.

a. 67. Another, of a dark brown Colour, with a small cast of red, and thick set, with bright shining Sparks extremely small. Out of a Fissure of a Mountain near the Skrees, Cumberland. There is Iron-Ore frequently found in the Fissures thereabouts.

a. 68. Another, black, out of the same Fissure.

a. 69. Another, likewise black, but with Specks of white and red, found in large Masses upon the top of a flat Mountain, near ... in Cumberland.

a. 75. Yellow-Ochre, very fine, from Shot-over-Hill near Oxford. This has been wash'd. The Ochre here constitutes a Stratum of 3 or 4 Inches thick, about 10 Foot deep. Over it, in Sand, lie numerous ferruginous Geodes, holding in them some Ochre, others Sand. See one of these among the additional English native Fossil-s, b. 79. Confer. a. 85. infra.

a. 76. Ochre, very fine, of a deeper Yellow, found in the same Fissure with a. 65. In sinking the Shafts for Lead, at about the distance
distance of half a Mile, they pass a Stratum of Coal about a Foot thick. Vide a. 77. infra.

a. 77. Another Sample, more harsh, and likewise somewhat harder, brought by the Water that runs out of the Adit of a Coal-Pit at Broughton, near Cockermouth in Cumberland, and settled down in Cavities at the bottom of the Adit, over which the Water passes. This is common in the Adits of many of the Coal-Pits in the North. I take it to be the ochreous Part of the Coal, drain'd by the Water, the bituminous Part never settling, but appearing upon the Surface of the Water, and swimming off. Vide a. 65. & a. 76. supra.

a. 78. Yellow-Ochre, coarse, veined with red and black; found upon a Moor near Whitehaven, in Cumberland.

a. 85. A harsh Earth, composed of Plates, alternately white and yellow; out of a Pit in which the Yellow-Ochre, a. 75. is got, on Shot-over-Hill near Oxford. This is the Ochre mention'd by Dr. Plot; but with the yellow has some white intermix'd.

a. 86. A harsh Earth, variegated with yellow and purple; found on the side of a Ditch near the Hill where Oyster-Shells are dug out, near Hedley in Surrey.

a. 90. Earth, very fine, and of a bright red, preferable to that brought from the East-Indies for the use of Painters; found in a Fissure, among Iron-Ore, in the Skrees, a Mountain in Cumberland. 'Tis a Red-Ochre. Conf. a. 65. supra.

a. 91. Red-Ochre, from Staffordshire.

a. 92. Red-Ochre, more stoney and hard; from Cumberland, Lord Bishop of Carlisle.

a. 100. Loam, very fine and soft, with very small Spangles of Mica in it; used for Moulds by the Bell-Founders. Thrup, Northamptonshire. Mr. Morton.

a. 101. Loam, more harsh, used for making the Bricks employ'd in building the Wind-Furnaces for melting Iron with Sea-Coal. 'Tis got at Hedgerley, about five Miles from Windsor.

a. 102. Loam, of a dusky green Colour, appearing to be composed of Clay and fine Sand, and the Tincture to be owing to an Admixture of a Vitriolum Martis: From Hamstead-Heath, near the Mineral-Spring; where 'tis found in considerable plenty.

a. 103. A reddish brown Clay, just as digg'd up out of the Earth. 'Tis used to make Bricks, and is of the best sort of Brick-Clay, dug up in the Fields on the East-side of Hyde-Park.

a. 104. Clay, little different from the foregoing, used for making of Tyles; from Kilburn, near Maryton, Middlesex. There are found among this Clay some Selenita: and there are many small ones in one Part of this very Mass; indeed there appear Sparks of that Body in all Parts of it. This had been flung up some Months, and expos'd to the Air: and there are green (Conf. a. 102. supra.) Efflorefcencies in several Parts of it, which seem to be of Vitriol; that Mineral, and the Pyrites, being very frequent in almost all Parts about this City for many Miles round.
There is very little Earth that does not contain some Salts in it. 'Tis very providential indeed, that those Salts are so dispers'd in it; they serving to mellow the Earth, as the Husbandmen speak, to open, loosen, and disentangle the Matter that serves for the Increment and Formation of Vegetables. The Design of the Workmen, in exposing the Clay to the Rain and Weather, is to drain it from those Salts, that the Bricks and Tiles may be the more firm and durable. If the Salts be not drawn forth before the Clay is baked, they do not only hinder its setting well in the Kiln, but are apt to liquate afterwards, and so make the Bricks and Tiles moulder and decay. I think there is an Act of Parliament ascertaining how long time the Clay is to lie expos'd before it be work'd up. The Pot and Tobacco-Pipe-Makers steep their Clay in Water for some time; and by drawing off the Water, drain forth the Salts before they use and make up the Clay.

a. 105. Clay, of a light brown Colour, used for the making Tiles, got in the Fields near Pancras. There are in it Veins of a blueish marley Matter; and, in some parts, very small Selenite. The Clays used for the making Bricks and Tiles, all burn red, and doubtless hold some share of Iron.


APPENDIX I. to CLASS I.

SANDS.

EXTRACT.

S Pangles, of a white silvery Talc, in Sand, + a. 7.
Spar, from a Vein, in form of Sand, + a. 2.
Sand, cohering pretty firmly, and having the Consistence of a soft Stone, + a. 4.
Sand, moulder'd, and beat off the Rocks by Weather, + a. 9.
Sand, used for the making of Glass, + a. 1.
Sand, dispos'd into its present State by the flowing of the Water, departing at the Deluge. Vide Preface to App.II. to Class I.
APPENDIX I. to CLASS I.

S A N D S.

+ a. 1. W H I T E  S a n d, used for the making Glass. From the I s l e of Wight.

+ a. 2. Loose Matter in form of Sand, very white and sparkling. It exactly resembles a fine white Spar, when broken; and indeed 'tis only Spar found in this manner. From a Vein of Lead-Ore, in Barrow-Work, Cumberland. There is found in the same Vein, as also in the Lead-Mines of Arkendale, of this very Matter, much groffer, to the bigness of Pease. Where there is found any of this Matter, the Masses of Spar in the Vein are usually very shattery and friable; so that this is doubtless nothing but Spar, either formed thus, or shattered and fallen to pieces.

+ a. 3. Sand, pretty gros, of a pale brown Colour, with a Caft of yellow; from a Gravel-Pit, near the Road a little on this fide Newington, Middlesex.

+ a. 4. Sand, very fine, of a grey Colour, with a Caft of green; out of a vast Stratum, lying underneath the Loam in the great Pit at the further end of Woolwich, Kent. This Stratum is bared down for near 20 Foot. It may be much thicker, they having not digged to the bottom of it. The Stratum of Sand at the hither end of Woolwich, and that at the farther end of Deptford, is wrought as deep into, tho' they have not sunk to the bottom of either. The Sand, in some parts of all these Pits, hangs pretty firmly together, and is in form of a soft friable Stone.

+ a. 5. Fine Sand, of a very light brown Colour; from the great Sand-Pit, at the hither end of Woolwich, Kent.

+ a. 6. Sand, pretty fine, brown, with a Caft of red; from a Sand-Pit on the South-East side of Croydon, Surrey. There was also, in the same Pit, Sand exactly of like Colour and Constitution with that + a. 4. Both sorts are got here in great plenty.

+ a. 7. Sand, fine, of a yellow Colour, with Spangles of a white shining Talc amongst it. Out of a Gravel-Pit on Hamstead-Heath, where 'tis found in considerable plenty.

+ a. 8. Sand, part pellucid, part yellow, and part black. From a Gravel-Pit on the South side of Marybone.

+ a. 9.
APPENDIX II. to CLASS I. 

GRAVEL.

PREFACE.

The Gravel about London, and in most parts of England, is no other than Pebbles, or Fiints, or both, with an Intermixture of Sand, chiefly of that sort that is compos'd of extreme little and small Pebbles.

The People of those Countries that afford no Gravel, are very sensible of the Inconveniences that attend the want of it. England abounds, in several Parts, with such as is very fine and good: and may be brought to be very smooth, binds well, and is capable of a very firm Confinement, so as to serve for the covering and making Alleys, and Walks.

That sort of Sand, that is in common Use about this Town, brought from Black-Heath, and other Parts of this Neighbourhood, viewed with a Microscope, appears to be nothing but very small Pebbles. It is found likewise in several other remote parts of the Kingdom. Whoever shall attentively consider the Manner in which this lies in the Earth, will see that it is not in regular orderly Strata, of equal thickness in all parts, as Stone-lies, and various sorts of Earth which are in their original State, and just as they subsided from the Waters, stagnating at the Deluge. No, this lies in Trains, and manifestly pitched in Streaks, and just as it would be cast by Water, flowing, in its departure towards the Ocean, and the Inlets of the Abyss, which are at the bottom of it. Gravel is shot and pitched into the same Method: and doubtless owes its disposition to the same Cause.
Cause. What adds much Confirmation to this is, that both are found commonly out of their proper Region, cast on lighter Matter that is dispos'd into Strata, and is in its original State. Thus we see even in this Neighbourhood near Deptford, on other Parts of Black-Heath, and in many more Places, a great Quantity of Sand, and Gravel, lying above Chalk: and when we come to dig thorough perhaps twenty or thirty Foot of Gravel down to it, we find the Chalk lying, in regular Horizontal Strata, underneath, down frequently to a very great depth. In my answer to Dr. Camerarius, (pag. 64. & seqq.) I have shewn what a vast and immense Quantity of Water there lay on the Surface of the Globe during the Deluge. And this was not only of mighty Bulk and Weight, but seems to have passed off in Hurry and Precipitation. There are in many Parts of the Earth Marks of the greatness of its force, and the Havock it made at its departure. In some Countries we find Fragments of Stone, of many Ton in Weight, where none of like sort is found, there, in the Earth, they having been torn off, and brought from afar. Lesser Bodies so imported, are found in many Countries without Number. By such Quantities of Matter, solid Stone, and the like, and loose Sand and Earths, being taken from one part of the Globe, and conveyed to others, great Alterations were made in the Surface. As to Sand and to Gravel, 'tis very probable the Pebles and Flints that constitute them were deposited at first, disper¬sely, in the Strata of Earth, Clay, Marl, Loam, or the like, as we at this day find them to such Strata as are yet entire. But when those Strata were torn up, and born off by the Water, the Earthy Matter, that was softer and lighter, would be easily washed away, and separated from the Pebles and Flints, that were harder and heavier. So that 'tis not strange that this sort of Sand, Pebles, and Flints, are found at this day collected together, and ex¬tracted from other Terrestrial Matter. We see Infiances of the like on the Sea-shores: Nor was this Hurry of the departing Waters without a Providential Conduit. These, and other Bodies, of greater use to Mankind, were selected, and brought together by it: The Bowels of the Earth were laid open to human View, and the Riches there brought nearer to the Hand of Man. The Loads or Veins of Metal were by this Action of the departing Water made easy to be found out by the Shoals, or Trains of Metallic Fragments, born off from them, and lying in Trains, from those Veins, towards the Sea, in the same Course, that Water falling thence would take.

There are Pebles and Flints now frequently found, among the rest in Gravel, that have their Surfaces rubb'd and smoothed, nay some much ground, and worn. All which was done by the hurry and force of the Water, in their removal from Place to Place. There are some Infiances of this in Class III. particularly. c. 227.
Gravel and the common Sand, clear’d, collected, and put into its present Posture and State by the Water, of the Deluge, departing, p.

Gravel consists of Sand, and Pebles or Flints. Of the goodness of the Gravel of England. The Usefulness of it.

**GRAVEL.**

x a. i. Gravel from a Gravel-Pit on Hamstead-Heath, Middlesex.

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**CLASS II.**

**FOSSILS that are solid, and form’d into Strata.**

**EXTRACT.**

*PART I.* Stone and Stony Substances.

**SECT. I.** The several sorts of Stone that break with equal indifference in any Direction.

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Grind-stone, b. 30, 31. Whet-stone, b. 32.
Sand-stone, b. 34.

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C. I. Extraneous Matter found lodged in Stone.

Mica in Stone, b. 1. 31, 32.
Selenita in Stone, b. 13.
Spar and Crystal in Stone, V. x. d. 40. Cl. 4.
A pitchy, or bituminous Matter in Stone, g. 1.
Nitre in Stone, g. x 30, 31.
Minerals of all sorts in Stone, Class 8, 10, 11.
Metals of all sorts in Stone, Class 12, & seq.

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C. 2. The Mechanical Uses of the several sorts of Stone in this Section.

A Stone, that endures the Fire, used for Hearths, &c. b. 1.
Copper, b. 31.
Free-stone used for Hewn-Work in the best Buildings, b. 12, 13, 14.
Stone used for Floors, Pavements, &c. b. 20, 21, 22.
Stone used for whetting chiefly Scythes, b. 32, 33.
--- for Grinding, b. 30, 31.
Sect. II. The several sorts of Stone that break or rise straight in only one Direction; splitting with a Grain, lengthways, or parallel to the Site of the Strata. V. Cl. 2.

Whetstone, b. 60. Blue Slate, b. 80.
Limestone. White Slate, or Flag, b. 85.
Ragstone, b. 70.

C. 1. Extraneous Matter found in the Stone exhibited in this second Section.

Mica in Stone, b. 60.
— in white Slate, or Flag, b. 85.
Talc in Ragstone, b. 70.
— in blue Slate, b. 80.
Salts in Shiver, b. 90.

C. 2. The Mechanical Uses of the several sorts of Stone in this second Section.

Stone used for whetting Tools, b. 60.
A smooth Stone used for setting a fine Edge, b. 70.
Slate used for covering Houses, grey, b. 80.
— White, b. 85.
A white Stone used for the flagging of Floors, for Cisterns; and Tanners Fatts, b. 85.
Shiver used in Agriculture. The Salts in it, when liquated by Rain, serve to mellow, open, and relax the Earth, b. 90. Conf. Cl. 1. a. 104.
Limestone. Of the great Use of Lime in Agriculture, Building, dressing of Leather, making of Soap, Fusion of Metals, &c. Also of its Uses in Physick, Surgery, and Farriery.

Sect. III. The several sorts of Stone that will not break straight, or in any certain Direction; but, by reason of certain Flaws, and Chaps, shatter, and break irregularly, and cross-grain'd; so as to be of little Mechanical Use. Conf. Cl. 2.

Appendix. The Error of those who suppose that Stone now grows. f. x53.

Part II. Alabaster, † b. 1. Conf. Cl. 2.

Part III. Marble.

Marble is found both in Strata, and in perpendicular Fissures, Cl. 2. Pref.
That found in those Fissures has no Sea-shells in it, ibid.

Masses
Masses of fine Marble found on the Sea-shores; being Fragments, of Strata, that are worn round by the Agitation of the Sea, *ibid.* or of the Water, departing, at the end of the Deluge. *Conf. Ap. to C. 2.*

Of the *Marmor fusile,* and the slender round *Scapi* of Pillars, in several Churches of *England,* supposed to be made of it. *x b. 60.*

*Conf. Cl. 4.*

**SECT. I. Veined Marble, Cl. 2.**

**SECT. II. Spotted Marble, Cl. 2.**

Porphyry, *Ω d. 36, 39.* A greenish Marble, with Linum
Granite, *Ω d. 32, 38, 38*.* 38+ Asbeslinum in the Seams of it,
Ophites, *x b. 25.* *†d. 8, & seq. x b. 28.*

**SECT. III. Marble both vein’d and spotted.**

**SECT. IV. Marble variegated and distinguished by Sea-shells, Corals; and other extraneous Bodies, contain’d in the Mass of it. Conf. Sect. 4. x b. 60.**

Some of the River and Sea-shells were filled with Spar before they were lodg’d in this *Marble.* *x b. 60.*

**SECT. V. Flinty-Marble, or that nearly approaches Bodies of the Flint or Agate-Kind, in Hardness, Politure, and Completion.**

*Flinty Matter* found both in Nodules and in Strata. *Conf. Pref. to this Sect.*

*Chert or Whern, x b. 85.*

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**CLASS II. (b).**

**FOSSILS that are solid, and formed into Strata.**

**PART I. Stone and Stony Substances.**

**SECT. I. The several sorts of Stone that break with equal indifference in any Direction.**

*b. 1.* *Stone,* *soft,* and of a pretty small Gritt; of a pale Grey Colour near white; with numerous small Mica’s of a white Silvery Talc. It endures the Fire well: and is therefore sometimes used for Bottoms of Ovens, but chiefly for Hearths, and Coveings of Chimneys. Got in considerable plenty near Rygate, *Surrey.*
b. 12. Stone, out of the great Quarry of Portland, of a pale or whitish Colour, composed of numerous small roundish Grains, not unlike the smaller Ova of Fishes. They split in the cutting of the Stone; so that it is capable of being brought to a Surface very smooth and equal. Besides, this, and all like sorts of Stone that are composed of Granules, will cut and rive in any Direction: as well in a Perpendicular, or in a Diagonal, as Horizontally and Parallel to the Site of the Strata. 'Tis for this reason that they have obtain'd the Name of Free-stone. Then these bear the Injuries of the Weather equally and indifferently in all Positions. Whereas all the Stone that is Slaty, with a Texture long, and parallel to the Site of the Stratum, will split only lengthways or horizontally: and, if placed in any other Position, 'tis apt to give way, start, and burst, when any considerable Weight is laid upon it. Which Inconveniences the Portland-Stone, being not liable to, cutting freely, and being of a Colour very good and agreeable, 'tis made use of for the better Buildings and Works about London.

b. 13. Another Mass of Stone, of like Texture, and from the same Quarry; but not quite so white. There are in this Mass several small Selenites: and, in some Masses of this Stone, I have seen much larger.

b. 14. Stone, of a pale brown Colour, very thick set with Pellicles of the Ova of Fishes, and small teftaceous Bodies, from Ketton, Northamptonshire. This also is Free-stone, and made use of for Building, particularly of several of the Colleges in Cambridge.

b. 20. Stone, of a light grey Colour, and of a pretty fine Grain; used for Paving. From Purbeck.

b. 21. Stone, of a light brown Colour, used likewise for Paving. From Purbeck also.

b. 22. Stone of a dusky brown Colour; thick set with Sea-shells. Used also for Paving. From the same Place.


b. 31. Stone, of like Grit; having several Micae of white Talc in it. 'Tis of a grey Colour, with a Cast of Red. From Whitehaven, Cumberland. 'Tis made use of there for Building: as also for Grind-Stones. It abides Fire very well: and therefore is likewise employed for the Building of the insides of the Cupules for running of Copper there.

b. 32. Stone, of much the same Constitution and Complexion, with that b. 11; only it has a slight Cast of Brown. There are likewise in it numerous Micae of a white Silvery Talc, and some very small ones of black Talc. This is used for whetting Scithes. 'Tis of the finer sort, and therefore is called fine Scythe-Stone, or Rubber. From Heage, in Derbyshire.

b. 33. Stone, composed of white and brown Grains, with small Micae of a Silvery Talc. This likewise is used for whetting of Scithes: and having a grosser Grit than the precedent, is call'd, 'C Sand.
Sand-Stone, Coarse-Scithie-Stone, or Rubber. From Spoondon, in Derbyshire.

b. 34. Sand-Stone, from Mount Hermon, near Tunbridge-Wells. There are several naked Rocks of it, composed of Grains of Sand, (Conf. + a. 9. App. to Clafs 1.) partly white, and partly pellucid. The exterior Parts of the Rock, that are exposed to the Weather, have frequently in them Spots and Veins of Black and Brown, as in this Sample, and sometimes of Red; those Colours seeming to have been caused by extraneous Matter introduced by Rain; the interior Parts of the Rock being generally free, clean, and white.

Sect. II. The several sorts of Stone that break freight in only one Direction; splitting with a Grain lengthways, or parallel to the Site of the Stratum.

b. 60. Stone, Grey, with a Cast of Brown, with numerous extremely small Grains of a black Mica, and some few, as small of a Silvery. Whet-stone got near Newcastle upon Tyne.

b. 70. A grey talky Stone. This is called Ragstone, and is used for setting an Edge to Knives, Chizels, Axes, and the like, after Grinding, or Whetting upon that sort b. 60. or other like Stone that is harsher and of coarser Constitution.

b. 80. Slate, Grey, with a Cast of Green: of a glossy, talky Constitution: (Conf. Clafs 4.) splitting even, freely, and into very thin Plates. From a Slate Quarrey in Newlands, Cumberland, about a Mile from the Black-Lead Mines.

b. 87. This is called in the North, White-Slate, or Flag. 'Tis thick set with Spangles of white Talc; from a Quarry by the Road between Carlisle and Newcastle. This sort of Stone is frequent in those Parts, and in the North of Yorkshire. 'Tis of a pale Brown; but there is of it of a Grey, or Ash-Colour. This is just half an Inch in Thickness; having the two Surfaces exactly smooth, even, and parallel to each other. This sort is everywhere where thus flat, rising in this Form, and in Layers of about this Thickness, for perhaps ten or twelve Foot in perpendicular. But generally the uppermost Strata are the thinnest; those that lie deeper gradually increasing in Thickness, till at last they are so thick as not to serve for Slates. The thicker Flags they use for Cisterns, and Tanners Fats, as also for Pavements and Floors; as they do the thinner for covering of Houses. For this last Purpose they use Plates of this from one to four foot Square. For, in the Earth, each Flag, or Stratum, keeps the same Thickness in all Parts, how far soever it be pursued horizontally; till the Quarry terminates. They lie level generally, or a little inclining.

b. 90. Shiver, of a dark Ash-Colour, near Black. From a Lead Mine at not far from Newcastle. It lies in Strata. Some of it is pretty hard; and to that they give the Name of Plate. But the softer sort, in raising, falls into Shivers like this in this Sample; which is the Reason of the Name. This Body much re-
fembles the Alum-Rock, both in Constitution and Colour: and
indeed most of it holds of that Mineral, more or less; for which
Reason, being wet, by Rain, or otherwise, the Salts liquating,
it becomes soft like Marie; and, as such, succeeds well in Agri-
culture.

Sect. III. The several sorts of Stone that will not break freight;
or in any one certain Direction: but, by reason of certain Flaws,
and Chaps, shatter, and break irregularly, and cross-grain'd, so
as to be of little Mechanick Use.

Part II. Alabaster.

† b. i. Alabaster, from Marged-Overton, Rutlandshire.

CLASS II.

PART III. Marble.

PREFACE.

Tho' Marble be frequently found lying in Strata, as is intimated
in the Title at the Head of this Class, yet 'tis sometimes like-
wise found in the perpendicular Fissures. That also is the case of
Alabaster. Of this there are Instances amongst the Vein-Stones: in
particular, that + f. 9. (App. to Cl. 6.) That which is found in
those Fissures, can never have Shells or other extraneous Bodies in
it, as that which is in Strata usually hath.

There are some Marbles also in the Lift of the Mica: and in
particular the Granite, Θ d. 32. 38. *38. as also Porphyry, Θ d. 36.
39. Then, in the Appendix to this Class, there are Fragments of
very various sorts of Marble found upon the Shores of England: and
several of them so beautiful, and fine, as to equal, if not surpass
the noblest Marble I have yet seen from Italy, so as well to deserve
to have further search made after them in the neighbouring Cliffs,
which, perhaps, (Conf. App. to this Clafs.) those Fragments
were forced by the Infults of the Sea. And indeed several of the
Masses in the Class of Coralloid Bodies appear to be Fragments of
Marble, of that sort set forth in the fourth Section of this Clafs, broke
off the adjacent Cliffs, worn, and rounded by the Agitation of the
Sea in Storms and Tides. In particular, that e 22, and several of
those that follow: as also e 35. and some others, found on the Coasts
of Lincolnshire and Yorkshire.

In the same Appendix, and in Class III. are likewise Instances of
Marble, worn, and rounded, found at Land, and at distance from
the Sea, that were torn from their original Strata, and so rounded
by
by the Water of the Deluge retreating towards the Sea, and the
Apertures at the bottom of the Sea, to which the Water tended, in
order to its return thorough them back to the Abyss.

Sect. I. Vein’d Marble.

xb.1. Marble, the Ground of a pale brown Colour, with
Veins of white Spar, and some Lines of a purple Colour. From
..... in Somersetshire.

xb.2. Marble, of a yellowish brown Colour, with Veins of a
bright Red and of White. From ..... in Wales. Sir Chr. Wren.

xb.3. Marble, of a dusky green Colour, vein’d with White.
Found in the way betwixt Ambleside and Penrith, in Cumber-
land; where there is a considerable Quantity of this fort.

xb.4. Marble, vein’d with White and Red. Plymouth. This
is somewhat harder than the white Genoese Marble.

Sect. II. Spotted Marble.

xb.25. Marble, the Ground of a dusky brown Colour, with
oblong Spots of a bright Green. This is a Species of the Ophites,
and was dug up in the Marl-Pit at Hunton, near the River Med-
way in Kent, mention’d by Dr. Hatley, Philof. Transactions, N° 155.
p. 463. The Doctor sent me this, averring ‘twas assur’dly dug
up there, tho’ he never saw any more of it.

xb.27. Marble, the Ground grey, spotted with a pale green.
Found on the Sea-shores at the Otium of the River Palmer,
Cornwall.

xb.28. Marble, the Ground dusky, near black, with a Caft
of Green, having in it Spots of a pale Green. In the Chaps,
Seams, and Fissures of this, is found the Linum Asbeinum. From
the Isle of Anglesey.

Sect. III. Marble variegated and distinguished by Sea-Shells, Co-
rals, and other extraneous Bodies contain’d in the Mafs of it.

xb.60. Marble, from Petworth, Sussex. The Ground grey,
with a Caft of green. ’Tis very thick set in all Parts of it with
Shells, chiefly turbinated. Some of them seem to be of that fort
of River-Shell that Dr. Lifer, Hist. Cochlear. Angl. p. 133. calls
Cochlea maxima, fusca fove nigricans, fasciata. Several of the
Shells are filled with a white Spar, which variegates and adds to
the Beauty of the Stone. That Spar was cast in the Shell before
this was repolished in the Mafs of Marble, as is demonstrable from
view of this and other like Mafs. Conf. Nat. Hist. of the Earth,
Part IV. Confed. 2. p. 181. & seqq. second Edit. This is of about
the Hardness of the white Genoese Marble.

The slender round Scapi of the Pillars of the Abbey-Church in
Westminster, and of the Temple-Church, are of this sort of Marble.
So likewise are those of the Cathedral Church of Salisbury, as I remember; and my Lord Pembroke assures me positively they are. Some Persons, that are less skillful in these Matters, fancy these Scapi, that occur in most of the larger Gothick Buildings of England, are artificial: and will have it, that they are a kind of fulil Marble, cast in cylindrick Moulds. Any one, who shall confer the Grain of the Marble of those Pillars, the Spar, and the Shells in it, with those of this Marble got in Sussex, will soon discern how little ground there is for that Opinion. And yet it has prevailed very generally. I met with several Instances of it as I travel'd thro' England: and had frequent Opportunities of viewing those, who asserted these Pillars to be factitious, Stone of the very same sort with that they were compos'd of in the neighbouring Quarries. Camden* had entertain'd the same Notion of those vast Stones of Stone-Heng; but is fully refuted by Inigo Jones†.

x b. 61. Marble, of an Ash-Colour, very hard, and taking a fine Polish. It is thick set, in all Parts, with Entrochi of different Sorts and Magnitudes, and lying in variety of Postures. They appear whiter than the rest of the Stone, by which means they make a pretty Variegation of it, and take as good a Polish. From the Peak in Derbyshire. Sir C. Wren. This is as hard as the Plymouth Marble.

x b. 62. Black Marble, in which are several Pieces of a white Coralloid Porus lodg'd in different Positions, so that the Sides of some, and the Ends of others appear. They are of several Sizes: the largest near an Inch in Diameter, the least not above one tenth of an Inch. The longitudinal Plates of these Bodies are join'd by several thin Cross Coralloid Septa, passing from one to another, and exhibiting a very elegant Texture. The Interfaces are generally fill'd up with a greyish semi-pellucid Matter, appearing to be Spar. Both the Coral and Marble take a very fine Polish: and the one being white, and the other black, make together a beautiful Composition. From ...... in Wales. The Tomb of Sir Thomas Gresham, the noble Founder of this College, is built of this Marble. It is in Great St. Helen's Church.

SECT. V. Marmor Silici vel Achati accedens. Flinty Marble, or that nearly approaches Bodies of the Flint or Agat-kind, in Hardness, Polityre, and Complexion.

PREFACE.

Tho' Flinty Matter be most commonly found formed into Nodules §, yet it is also sometimes found formed into Strata, of which there is an Instance in x b. 85. infra. I am not sure whether the

* In his Britannia, p. 95.
† Stone-Heng restored; p. 33.
‡ Conf. p. 33; infra.
Roman Word Silex answers exactly to our Flint. This is certain, that would strike fire, was very hard, and broke sharp in Angles like our Flint. 'Twas also in Nodules, and used both in Italy and Greece, mix'd with other Stone in the Walls of Buildings, in like manner as before in Kent, Surry, and other Parts of England. But the Romans also apply'd the Word Silex to denote Stone very hard, black, white, and red form'd into Strata.

x b. 85. A Mass of a greyish horny Constitution, with Streaks of Red in it. 'Tis very hard, and semidiaphanous; very like the common Agat, and gives fire as readily. From the Moulds in Arkendale, Yorkshire. The Stratum, off which this was broke, was about 3 Foot thick. I traced it for 20 or 30 Yards in length: and found a like Stratum, probably the same, at about a Mile's distance. I have observed Strata of this sort in several Parts in the North of Yorkshire, interposed amidst Strata of a grey Lime-Stone. There is another sort of it of a dusky Hue, and much like the common black Flint. This the Miners there call Chert, and Whern. The Stone-Cutters of London, Nicomia, 'Tis so hard, that the Picks and Tools will not touch it. It will not split; but breaks irregularly, with a Grain cross, like that of the common Flints. There are also in some of this natural Cracks, as there are in those.

APPENDIX to CLASS II.

Affes of Marble, and the finer sorts of Stone, that were originally beat off from the Strata of the neighbouring Rocks and Cliffs down upon the Shores, and there rolled and moved to and again till they were rounded, smoothed, and reduced to the Form of Pebles, by the Water of the Sea, or Rivers, when put into Agitation by Tides and Storms; or, by the Waters departing at the end of the Deluge. Also of Stones perforated by Pholades, and other Creatures. Concerning these Bodies, see p. 25. infra.

x Silicis Scintillam excudit—Æneid. I. 178.
† Dura Silex—ib. vi. 471.
* Acuta Silex. ib.viii. 233.
‡ Lapis Globosus. Plin. xxxvi. 22.
§ Plin. ibid.
++ Plin. ibid. 8 & xxxiii. 4. Virg. Eclog. I. 15. Æneid. vi. 622, &
viii. 233.
† Mr. Hardy, who has work'd in it, assures me 'tis near as hard as Agat.
EXTRACT.

Porphyry, *b. 2.
Micae in Marble, *b. 11. 19.
Marble vein'd with white Spar, *b. 11.
Parts of the same Mass of Marble of different Hardness, *b. 17.
Marble scoop'd and perforated by Pholades, *b. 19. &c. seqq.
Marble that takes a Polish not inferior to that of Agate, *b. 9.

PREFACE.

Tho' it be true that many of these Bodies have been beat out of the Cliffs by the Insults of the Sea: and some of them from off the Rocks there, and afterwards smoothed and rounded by the Waves and Action of the Sea on the Shores; yet, because we find several of Constitution very different from the Stone of the neighbouring Rocks, 'tis most probable that these latter, at least, were Remains of Fragments, broke off from harden'd Strata, borne thence, worn and rounded by the Force of the Water departing at the latter end of the Deluge; and finally, many of them left, with other Bodies, when the Force of the Water abated. Such indeed are frequently found in the midland Parts, (Conf. Clas. 4. Part 1. Pref. infra.) of most Countries, as well as nearer to the Seas, and even to the very Shores, whence they are wash'd forth by the Agitation of the Sea. See the Nat. Hist. of the Earth, Part IV. near the end, treating of the Sea beating Amber out off the Cliffs.

Marble and Stone worn and rounded by the Motion of Water.

* b. 1. A Mass, brown, with a Blush of Red; thick set with Spots of White. Found on the Shores at Loo-Beach, Cornwall.
* b. 2. Another, little different, only the Ground is of a more dusky Brown. Found amongst several others on the Shores at the Land's-End, Cornwall. There are vast Strata of Stone of like sort in the Country thereabouts, and particularly in the adjacent Cliffs, from which these Masses were first broke and forced, and afterwards smooth'd and rounded by the Working and Agitation of the Sea. This is much like the true Porphyry, both in Colour, Spots, and Constitution.
* b. 3. Another, the Ground light Red, with numerous Spots of a dark Blue, and some few of White. From the same Shore.
* b. 4. Another, variegated with Red and White; found along with *b. 1. at Loo-Beach, Cornwall.
* b. 5. Another, the Ground Red; with Spots, some White, others Pellucid. Found in the River Palmer, not far from its Discharge into the Sea. Cornwall.
* b. 6. Another, variegated with Red, White, Brown, and Yellow. From the same Place.
*b.7. Two others, variegated with Brown, Red, and White; from the Shores at the *Lands-End, Cornwall.*

*b.8. Another, the Ground a deep Red; spotted and lineated with a bright Red, and White. Found upon the Shores near Overthorn, in Holderness, Yorkshire.*

*b.9. Another, of the same sort, from the same Shore. This is cut, and polish'd. 'Tis a very beautiful Stone, taking a Polish almost equal to an Agat; and superior to any Marble I ever saw.*

*b.10. Another, the Ground a dark Ash-Colour, spotted very thick with White. Found in the River Palmer, Cornwall, along with *b.5. and *b.6.*

*b.11. Another, the Ground Brown, with a Cast of Red, thick set with Mica of a white silvery Talc; and vein'd with white Spar. From Loo-Beach, Cornwall.*

*b.12. Another, the Ground Ash-Colour; with Veins of a fine White intersecting each other in a very remarkable manner. From the same Place.*

*b.13. Another, the Ground Brown, with Spots of a dusky Yellow; vein'd with White. From the Shore near Overthorn, Yorkshire.*

*b.14. Another, the Ground an Iron-Grey; vein'd with Red and Incarnate. Found, amongst many other like Bodies, on the same Shore of Overthorn. There is got near Plymouth a Marble of like Constitution with this: and with the Ground and the Veins of like Colour.*

*b.15. Another, the Ground a dark Ash-Colour; vein'd with White. From the same Shores. The Parts of this Stone that are white, stand forth somewhat above the ordinary Surface of the Stone, as being harder than the rest, and so having better maintain'd themselves against the Attrition these Bodies undergo by the Motion of the Sea on the Shores.*

*b.16. Another, the Ground a yellowish Brown; vein'd with White. From the Shores of Lincolnshire, betwixt Skegness and Ingoldmels.*

*b.17. Another, the Ground Grey: thick set with Veins of White, intersecting one another in a very remarkable manner. From Loo-Beach, Cornwall.*

*b.18. Another. This is of a Grain not so fine as the rest: but is variegated and veined with Red, and a very pale Grey, in a very beautiful manner. Found on the Shore, under Pendennis-Castle, Cornwall. There is among the rest, a Stratum of Stone of this sort in the neighbouring Cliffs; whence this doubtless was beaten.*

*b.19. Another, of an Ash-Colour; thick set with Mica of a white silvery Talc. It is scoop'd and perforated by Pholades or some other like Fish. Found, among a vast many others, on the Shores betwixt Workington and Whitehaven, Cumberland.*

*b.20. A dark-grey Mafs, found on the Shores of Lincolnshire, betwixt Skegness and Ingoldmels. 'Tis of an oval Form, about two Inches long, and one and a quarter over. 'Tis perforated in all parts.
parts of it, and thorough the whole Body of the Stone, the Perforations running into, and communicating with one another. They are so very numerous, and thick set, that they take up as much space as the Substance of the Stone that parts them does. The largest of them are capable of receiving a Vetch; but there are others less, in all degrees. There’s one part of it somewhat more free from these Perforations than the rest of the Body. The Planks of Ships are frequently perforated in this manner: only those Perforations are commonly larger. And the Shells of Oy¬sters *, and other like crafs Shells, are frequently found eroded and pierced in all Dimensions, and sometimes full as much as this Stone, by a sort of Worm. I do not undertake to determine whether this, and other like perforated stoney Masses, be so wrought by Insects: but ’tis certain the Pholades work themselves into, and perforate Stones as hard as these. About Weymouth there are grey and white Stones much bored and scoop’d by Pholades. Mr. Ro¬bert Ball tells me he saw Marble, cut into form of Pillars, taken up at Sea, off Leghorn, that was so much scoop’d and hollow’d by Pholades, that ’twas spoil’d, and render’d of no Ufe. ’Twas of the common white Carara Marble: and had been cast away, and bin in the Sea, about sixty Years. He also affures me the red Coral, dragg’d up on the Coasts of Italy and Spain, is often found perforated and eroded by Worms under Water. The true Purpura, of which we have not in England, bores Holes in Stones to get at the Fifth. Vide Cat. of the Exotic Fossils, part 2. p.121. ’Tis worth In¬quiry whether the saline Steams of the Sea have not some such Effect upon the Stones on the Shores. The Author of the Observations, Philof. Tranfatt. N.27. p.495. acquaints us, that “on the “Point Cagna, the Iron Guns at the Fort were so corroded, that “some of them were become near ufeles, being perforated almost “like Honey-Combs.” This he ascribes to the Salt Steams arising from the Sea.

* b.21. Another of a whitifh Colour. ’Tis perforated in like manner as the precedent: only the Surface of a considerable part of it is not so much perforated as the rest of the Body. Found on the same Shores. Mr. Morton.

* b.22. Another of a pale brown Colour. On only one side this is perforated or set with Pores, generally oblong, smaller, and fewer in number, than in either of the former. The Surface of this is pretty fMOOTH. Each Pore is environ’d with a small white

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* See Mr. Azout’s Observations on the Worms in Oyster-Shells, Philof. Transf. N.12. p.204.

Circle, and that with a brown, darker than the common Colour of the Stone. Mr. Morton. From the same Shores.

*b. 23. Another, of a darker brown, perforated in all parts of it. Found on the Shores near Sunderland in the Bishoprick of Durham.

*b. 24. A Mafs of a brown Colour, variegated with several Lines one within another, alternately of a lighter and darker brown, so as together chiefly to compose an Oval very much resembling a Knot in a Piece of Wood. In a large part of it are several straight, round, tapering Perforations of several Sizes, from $\frac{3}{4}$ of an Inch over in the biggest part, to about $\frac{1}{15}$ of an Inch. These are generally encompass'd with Circles of a pale brown Colour, near $\frac{1}{10}$ of an Inch thick: Some of these Perforations are fill'd with small Crystals. Found on the Strand near Harwich-Cliff.

*b. 25. A Mafs of a pale brown Colour without; within 'tis white with a glossy Lustre, like that of some sorts of Spar. Upon breaking it, I found some small Cavities in it, from the sides of which arise several small crystalline Columns, hexangular, pointed, and very transparant. On one part of the Stone there appears a Cast of Red. Found on the Top of an Eminence, near Dorchester, Oxfordshire. Before I broke it 'twas smooth on the Outside, and appear'd to be worn, and rounded by the Motion of Water. There were some other like Masses, which, being broke, shew'd themselves to be only Spar out of some Vein or Fissure of a Stratum, whence they were born by the departing Water at the End of the Deluge. There was no appearance of any Fissure near.

*b. 26. A Mafs of a dusky Iron Colour, the Surface smooth'd by the Motion of the Water. From . . . . in the Peak, Derbyshire. This may serve well for a Touchstone.

*b. 27. A green Mafs, surounded, in one part with a Zone of a pale yellow. From the Shores of Outhorn, Yorkshire.

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**CLASS III.**

Pebles, Flints, Agats, and Stones related to them. Vid. Pref. to Cl. 3.

**EXTRACT.**

| A plated Pebble, c. 209. | 25. 34. 37. |
| Semi-pellucid Flints and Pebles, c. | Flints with Undulations on their |
| 32. | *Etes
Observations and Reflections.

Of the Silex of the Antients, Vid. Pref. to Sect. 5. Cl. 2.

Pebles and Flint are natural Nodules; and were all originally covered with a Film or Crust, Vid. Pref. ad Cl. 3.

Some of them had that Crust worn off by an Attrition, caused by the rapid Motion of the Water, retreating toward the Sea and the Abyss, at the End of the Deluge, c. 227. Vid. App. to Cl. 2.

Others, found upon the Shores, have had their exterior Crusts fretted off by the Agitation of the Sea, Vid. Pref. ad Cl. 3.

Pebles, Flint, and Bodies of the Flint-kind, have no Grain, as the Workmen speak. Nor will they be brought to split in any determinate Direction; but break irregularly and uncertainly, Vid. Pref. ad Cl. 3.

Pebles and Flint are composed chiefly of Crystalline and Pellucid Pebles and Flints.

Cryalline and Pellucid Pebles and Flints.

Cryalline Shoots in the Cavities of Flints and Pebles, c.* 243.

Flint, with Bubbles, of a semipellucid or corneous Constitution; and striated like the Hematites, c. 263, &c.

Cretaceous Matter in the central Cavities of Flints, c. 258.

A Pebble seeming to have been compris'd or restrain'd during the time of its Coalition by some outward Force, c. 226.

Small Pebles immers'd in a Mass of flinty Matter, c. 4.

Several Pebles united in the same Mass by means of a natural Feruginous Cement, c. 1, &c.

Pebles immers'd and lodg'd in Strata of Stone, c.* 3. 13.

The Pebles, now inclofed in solid Strata, were all originally loose, single, and separate, c. 17.

Of the Origin and Formation of Pebles, c. 37. 45. 227.

Of the Cracks in Flints, x d. 40.

Flinty Matter sometimes form'd into Strata, as well as into Nodules, Vid. Pref. ad Sect. 5. Cl. 2.

Masses of Marble, rounded, and worn into the Form of Pebles, by the Agitation of the Sea, to be distinguish'd from the true Pebles, Vid. Ap. to Cl. 2, &c.
C. 2. Of the Uses of the Bodies of this Class:

Agats, &c. for Heads of Canes, Hafts of Knives, &c.
Flints used in Building, Vid. Pref. ad Sed. 5. Cl. 2.
Pebles and Flints used for Pavement.
Small Pebles incorporated and cemented together by a gritty Mafs used for Millstones, c. 1.

Pebles, Flints, Agats, and Stones related to them.

PREFACE.

Calculi, Pebles. Under this Title I intend Bodies of very various Colours: and somewhat of the Constitution of Spar, but much harder; breaking irregularly and uncertainly.

Silices, Flints. Bodies of various Colours, but ever with a con¬neous Ground; and harder than Pebles; but breaking irregularly as those do. Agats, Cornelians, Chalcedonies, Onyxes, and Mochoes, are no other than Flints: but finer than the Common, and have obtain’d those different Names from certain Differences in their Colours.

The true Flints, and Pebles, are all natural Nodules: and, many of them, were originally cover’d with a thin exterior Film or Crust, (Conf. c. 37. a. to c. 37. h. & c. 89. infra) that usually differs in Colour, Hardness, and Constitution from the interior Substance of the Body *. This was their first State before they were reposited in the Strata.† Since which time several have been broken by some accidental Force: and others, tho very rarely, because of their great Hardness, have been worn, and had their investent Film fretted off by the Agitation and Motion of the Water, of the Deluge returning, (Conf. Append. to Cl. 2.) of the Sea, and of Rivers. But these, tho thus alter’d, may be judged of by their internal Constitution; and by their Hardness. These two Tests alone sufficiently distinguish them. As to their Form, they have that in common with the Pyritæ, and other Nodules: and indeed with certain small Masses of Stone, and of Marble, that are frequently found upon the Shores of the Sea, and of those Rivers that are impetuous, and their Water much agitated by Tides and Storms. These have indeed the Form

* Of the Crusts of the Ludus Helmontij, vid. Clafs 4. part 3.xd. 25. Of the Crusts of Amber, g. 47. 9. 48. infræ. Of Pyritæ, h. 36. & h. 40. h. 45. Of Geodes, Mineral Bezoar, Ætites, o. 102. † o. 1, & seq.
† Vid. Natural History of the Earth, Part 4. Conf. 23.
of Pebles, but not, ordinarily, either their Hardness or Constitution; and are never invested with a Film or Coat. They split regularly, and with a Grain like several Bodies that are lodged in Strata; which the true Flints or Pebles never do. In a word, they are only Fragments, bear off from the Strata of Stone and Marble in the neighbouring Cliffs; and worn into that Form by the Waves and Water. Of these there are Instances in the Appendix to the second Class; as also of those that were smooth’d and rounded by the Water, departing, at the end of the Deluge. Conf. c.167. infra. & c.227. infra.

Pebles, Flints, Agats, and all other Stones of the Flint-kind, are composed of Crystal; but ordinarily with an Admixture of Stony, Mineral, or Metallic Matter amongst it. Some Pebles there are that consist entirely of pure Crystal: and the more transparent and fine Flints, Agats, and the like, owe that Transparency to the Crystal in them. Those that are more Opake, have less of this; and more Mineral, or Metallic Matter in them. 'Tis to this that the brighter Colours, Red, Yellow, Blue, &c. are chiefly owing. Conf. Cl. 11.0. 82. infra.

Of flinty Matter formed into Strata. Vid. Pref. ad Sect. 5. Cl. 2.

When I came to review this Class, I found in it a considerable number of Bodies that exhibited nothing particularly observable or uncommon. All these therefore I have rejected; being not willing to incumber this Collection with Repetitions, and Things that exhibited nothing new, or different from the rest. The Bodies of this Class being numerous, and ranked in haste, they do not properly belong to this Class; which I have noted in the Accounts of them.

Pebles, Flints, Agates, and Stones related to them.

c. 1. Small Pebles, from the bigness of the Seed of Rape to that of a common white Pea, some pellucid, others white, others brown, black, &c. all incorporated into one Mafs, and cemented naturally together by a sort of ferruginous Matter. This is used for Mill-stones. From ——— in the Peak, Derbyshire.

c. 2. Another Mafs, but the Pebles most of them much larger, and of different Colours. They are cemented together also by a sort of dark brown ferruginous Matter. In some parts of the Mafs, the said Matter is formed into Crufts not unlike those of the Bezoar Mineral: and there are Veins of it running upon the Surface of the Pebles, and Flints, which (in this) are mix’d amongst the Pebles. Found near Southampton.

c. 3. Another Mafs of Iron-stone, of a dusky red Colour, in which are eight or nine brownish-white Pebles, about the bigness of Wall-nuts. Banstead-Downs, near ——— Surrey.
c. 3. Another like Mafs, with reddifh Pebles in it, from White-haven. There are vaft Mafsles of an hundred Weight and bigger, of this Matter, containing these Pebles, found lying in Strata, of Grey Stone in the Cliffs and on the Shores there.

c. 4. Pebles, white with a brown yellow, from the bignefs of an Horse-bean to that of a Nutmeg, cemented together by a grey Flinty Matter, with very small red, black, yellow and white Spots; perhaps they may be small Pebles. The whole is cut into an Oval Plate, and that polished, both the Pebles and Cement taking a very good Polish. Here was a double Process; first of the Formation of the small Pebles; and next the Coalition of the Flinty Matter, that united and cemented them into one Nodule. From near Barkhamstead.

c. 5. Another Oval-Plate, in which the Pebles are some of them of about the bignefs of an Horse-bean, the reft generally less. They are black, white, grey, yellow, and variegated. The Ground, or Cement, pale-grey, with a Coat of yellow in some places. The whole takes a fine Polish, and 'tis a very beautiful Stone. Barkhamstead.

c. 6. Another like Plate, the Pebles much of the fame bignefs with those of the foregoing; most of them are black, the reft grey. The Ground or Cement is of a brownifh yellow Colour. It takes a fine Polish, and the whole is very elegant. Conf. N. c. 7.

c. 7. The Stone, off which the precedent Plate was cut. 'Tis a large Nodule of a comress'd round Shape, the Surface pretty smooth, the whole outwardly appearing like a yellowifh Peble with black Spots. Found in a Gravel-Pit on this fide Tatnum-Court, along with N. 263. infra. The Surface of this, rightly consider'd, shews it to have been rounded, worn and smooth'd by the Motion of the Water. Conf. Appen. to Cl. 2.

c. 8. Pebles of much the fame Sizes with those in the three foregoing. They are white, with some degree of transparency. They are held together by a brown Cement. The whole is of a flat oval Form, about two Inches long. The Surface is worn and smooth'd, but not quite fo smooth as that of the former: but it takes a fine Polish. Hempfiead, Hertfordshire.

c. 10. Many small white Pebles, with a few black, held together by a red Cement. The Surface of the whole very smooth. Found in the North-field of Draycote, on that fide towards Risby, in Derbyshire.

c. II. Many small Stones, generally about the bignefs of Peafe, and flattifh, held together by a pale-brown coarse Cement. From —— Hill in the Road between Cirencefer and Gloucefer. There is a vaft Quantity of this fort of Mafs in the faid Hill; and, on the Sides of it, prodigious Numbers of the fame fort of small Stones, loose, and difengaged from the Cement. Perhaps these may be of that fort that the Antients call'd P etc. There is a piece of a striated Peâcunculus incorporated in this Mafs. "Near —— a Se-
"pulchral Monument, shewn for Rachel's Tomb, Gen. 35. 19. not "far from Bethlehem, in Judea, are found a sort of small round "Stones exactly resembling Peas." Mr. Maundrell's Journey from "Aleppo to Jerusalem. p. 86. Strabo Geogr. 1. 17. p. 808. d. takes Notice, that in Egypt, near the Pyramids, there were Heaps of the Chippings or Hewings of Stone. [κατὸς τὸς σωροὶ τινις] And in these "were found Stones of the Shape and Bigness of Lentils. [Ψύγματα καὶ τύτω καὶ μεγίθης Φακοειδῆ:] The fanciful Tradition of the Inhabitants concerning these was, that they were of the Remains, of what were wont to be eat by those that work'd in Building the Pyramids, in Tract of Time turn'd into Stone. He observes also that there were plenty of these Lenticular Stones on an Hill, where he dwelt, in Pontus, ib. Plin. 1. 36. c. 12. p. 654. b. agens de Pyramid. Ἀγ. — "Harena late pura circum, lentis Similitudine, qualis in "majori parte Africa."

c.* 11. Small Nodules, some round, others oval, of a dusky grey Colour; found in a Stratum of Shiver, in Arkendale, Yorkshire. The biggest of these do not much exceed the Size of the common Bean: and there are seldom larger found.

c. 12. A Flint perfectly pellucid, of a lenticular Form, the lon-
gest Diameter about an Inch and a Quarter. The Surface is very smooth and polite. This was given me for English; but I have forgot where it was found: and the Person that gave it me is now dead. There are said to be of these Stones found somewhere about Bristol. Dr. Lister has described and grav'd some of them. Philos. Trans. N. 201.

c. 12. a. A Crystal, or pellucid Flint, wrought into an orbicu-
lar Form, found somewhere in England. This is of that sort that is call'd mineral Pearl: and probably the same mentioned by Suetonius, in Cæsare, §. 47. "Britanniam petisse sponagargaritarum, "quarum Amplitudinem conferentem, interdum sua manu exegisse "Pondus."

c. 13. Another Crystalline Flint, of an oblong Form, the Bases near flat, the upper Part terminating in a Ridge. The Bases, and Sides are not plain, but somewhat swelling and convex. 'Tis regular and polite, as if wrought by Art. Conf. N. 12.

I have since shewn this to some Lapidaries; who agree that this Body is cut and polish'd. 'Tis part of a Crystalline Nodule. There's one of this Figure set forth by Dr. Lister, Phil. Trans. N. 201, who thinks those naturally Polished, but erroneously: 'tis very probable all these Bodies were us'd for Ornaments among the ancient Britains. Mr. Aubrey was wont to affirm they were us'd in Magick by the Druids: and I believe intimates some such thing in his Natural History of Wiltshire: for which he had made Collections. They are now in two Volumes MSS. in the Ashmolean Museum in Oxford. In his Miscellanies, 8vo. Lond. 96. p. 128. c. 15. he mentions a Crystall Sphere, or Mineral Pearl, us'd by

* See Dr. Plat's N. H. of Staffordshire, p. 178.
Magicians: and to be inspected either by themselves or by a Boy. Mr. Webbier in his Book of Witchcraft also treats of these Bodies. c. 16. p. 310. & seq. This was found near Barkhamstead: and made use of, as Mr. Steel informs me, by the late Dr. Woodhouse, there, as a Magical Speculum, he pretending that a Spectrum was wont to discover itself to him in it. Mr. Steel fancies the Glafs, as 'twas call'd of Dr. Dee, and Mr. Kelly, mention'd by Dr. Meric Gafaubon, was of this fort. For my own part I can imagine these to be nothing other than Baubles, used formerly as Ornaments by the Britains, while Savage, and before the access of the Romans. Mr. Morton found one of this fort in Kettering-Field, Northamptonshire.

c. 14. A Pebble, about the bigness of a Wallnut. 'Tis wholly pellucid. From Oxforshire. This kind the Lapidaries call Pebble-Cryystal. The Crystattal hexagonal Columns they call Sprig-Crystal.

c. 15. Another, somewhat less, also pellucid. Ibid.

c. 17. 4. Pellucid Pebbles about the bigness of Peafe. One of them I got out of a gritty Stone, made up chiefly of such Pebles, cemented together, near Wrocefsier: the other three out of a reddish gritty Stone, much like that N. 1. infra, near Belpor in the Peak. There are vast Quantities of that sort of Stone about Belpor, Worksworfs, and the Places thereabouts in the Peak. It lies in Strata. There are mighty Rocks of the same sort about in the Forrest of Dean in Gloucefsiershire: and the Pebles and Flints, contained in them, are of all Sizes, little and large. Their lying thus in Strata is a Proof that the Pebles and Flints were single, independent and apart till after the subsidence. When the Matter subdied down with them, and settled in the Intervals of them, consolidating, became a Cement to hold them together.

c. 18. A Crystattal Flint, cut Diamond-wise. 'Tis of a clear Water, and fine Polish. 'Twas found in a Field near Croydon, Surry.

c. 19. A light grey Semi-pellucid Flint. 'Tis of such the same Complexion with the common Indian Achate. On one Part of the Surface 'tis thick set with Tubera like small Bubbles. Found in a Gravel-Pit, near Kentfly-Town. Vid. N. 263. infra.

c. 20. A piece of the foregoing cut into an oval Plate, and polish'd.

c. * 20. A Plate of an Agate, no ways inferior to the finest oriental Agate, and nearly approaching the white Cornelian. There are in the horney Ground two white Lineations; attended with two of a pale Red, not discernible unless held up to the Light. The Stone, off which this was cut, was found near Gaddefden magna, Hertfordshire.

c. 21. Three round Plates, cut out of a Flint, approaching the nature of an Agate, and indeed very much resembling those Agates call'd Mochoa-Stones, with Appearances of Shrubs in them. The Stone, off which these Plates were cut, was found near Stratford in Essex.
and, having in it a friated Concha Anomia, is exhibited in the 2d Part of this Catalogue, of the extraneous English Fossils, f. 346.

c. 22. A Semi-pellucid grey Flint. In the Body of it are white Plates or Flakes, usual in some of the Indian Achates, which this resembles and equals in all respects. 'Tis cut, and polished. Found by the Thames side, on Lambeth Shore.

c. 23. A Flint much like that N° 19. only scarce so clear. Tatnum-Court, Middlesex.

c. 24. Another of like sort: only one part of it is of a brownish white Colour, and Opake. Broke off a Flint on Sydenham Common, Surrey.

c. 25. A pellucid Peble, with a faint Eye of Green. 'Tis about the bigness of a Nutmeg. There appear in it several long round Bodies of the thickness of small Pins. They are placed at uncertain distances, but near parallel to each other, and run flanting across the Peble, which is a little flattish, and both ends of them terminate in small holes at the two opposite Flats of the Surface of the Stone. They are of a green Colour, and appear very plainly and distinctly in the Body of the Peble. Found on the Shores near . . . . in Cumberland.

c. 26. Another Peble, red and semi-pellucid, less than the foregoing. There are in this several Columns, little different in any respect from those of that, only they are white. Found on the Sea-shore, near . . . . in the Bishoprick of Durham.

c. 27. A Peble of the bigness of a Nutmeg, white, with fine streaks of red on the Surface, and thorough the Substance of it. 'Tis semi-diaphanous, and takes a fine Polish. Found on Plow'd Lands a little beyond Henley upon Thames.

c. 29. A Peble of a flat oblong Shape, somewhat bigger than an Horse-bean. The Surface of it is smooth and very fine. 'Tis opaque, and of a dark green Colour. Found with N. 26, & 27.

c. 30. A small Peble, semi-diaphanous, yellowish, with flight streaks of a somewhat darker Colour. Found on the same Shores.

c. 32. A Peble, semi-pellucid, brownish, with Spots of a whitish hue. On one side is a Cavity, the sides of which are beset with a Crystalliz'd Spar. Found on the same Shores.

c. 33. Another Opake, its Surface finely variegated with Spots of a Flesh-colour, a dark red, and streaks of white. The same Shores.

c. 34. Another, very transparent. In the Center of it is a fine Cloud of red. The same Shores.

c. 35. Another, the out parts pellucid, the middle opake, and of a very bright red. From the hither Edge of Blackheath, near Deptford.

c. 37. A grey Peble, pellucid, having on one Part very many thin white triangular Crufts, one within another, appearing like a Neat of triangular Boxes set one in another. From the same Shores.

*37. Another whitish with a Coat of red; having many like Crufts in it. From the Shores near Whitehaven in Cumberland. These Crustaceous Pebles, Flintis, and other Nodules of like Constitution,
ftru&ion, particularly the native Bezoar mineral, Goedes, &c.
The Beginning or first Advances towards a Formation, was by the
Congress of certain of their constituent Corporufcles at one Place or
Punctum, where they formed a Nodule. Other Matter succeeding
towards the same Point, on all sides the Nodule, and affixing upon it,
still augmented the bulk of it. When it so fell out, that this Matter
was of the same fort with that that concurred before to form the
central Nodule, there could be no variety of Colour, or Con-
fidence, from this or any more like Additions that were made to it.
And 'tis highly probable that all the Nodules, that confift of one uni-
form Substance, were as well formed thus, beginning from a
Point or Center, as the crofted ones: Nay, and most of the spott-
ed, variegated and clouded ones too, and all others, however mix'd
and variegated, or how different Matter forever might concur to
the forming them, and indeed all whatever except those that are
tabular and plated, of which vid. e. 209. Cl. 3. But where the said
succeeding Matter was not of the same fort with that of the cen-
tral Nodule, 'tis distinguishable by its Colour, or Confidence, and
appears upon breaking or cutting the Body, as a Shell or Crust
enclosing the central Nodule. Again, other Matter still succeeding,
and applying it fell on all sides quiteround this first Shell or Crust,
where 'twas of a different fort, it constituted a second Crust cov-
ering the former. A third application of different Matter constitu-
ted a third Crust: and so on, as long as a successive Application of
different Matter continued.
The thickness of each Crust, is greater or less, as the Quantity
of Matter so succeeding to form it was greater or less.
The same Crust is in all Parts of the same thickness, when
there happened to be an appulse of an equal Quantity of Mat-
ter on all sides the Nodule, or, if there were such before in-
crusted round it, the interior Crusts*. But where the Quantity of
Matter so applying it fell was unequal, and more on one side than
another, there the Crust, form'd of it, is of different thickness in
different Parts; which is frequently observable in the Crusts of
Nodules. Hence 'tis that we commonly find the central Nodule
not in the middle, but approaching nearer one side of the Stone.
Of this there are Instances infra.

Where the Matter that formed any single Crust was homoge-
neous and all of the same fort, the Crust is uniform and of the same
Colour and Confidence: but where 'twas different, the Crust
formed out of it differs in Colour or other ways. This is the Cause
of all the Varieties observable in the same Crust.

Where the Matter that successively applied it fell to the Nodule
in its Formation was on one side homogeneous and entirely of the
same fort, on the other side of different sorts; the Stone formed
of such, would be on one part uniform, on the other crusted with
half Crusts or Hemispheres.

* Of this e. 37. a. e. 37. c. d. and e. are Instances. Where
Where the central Nodule was globular, the inner Surface of the first crust would be Spheric; and if the crust was in all parts of the same thickness, that whole crust would be Spherical. But if the Surface of the central Nodule was unequal and irregular, the crust formed upon it would be so likewise. So also for the several succeeding crusts each without the other.

If the Matter whereof the several crusts were formed happen'd to differ in Diaphaneity, Colour or several other Respects, yet agreed in Hardness, Figure and Disposition to unite and confidurate, the several crusts would cohere and form one common Solid, as they do in Flints, Agats, and the like. But if the Matter of the several crusts happened to be of different Constitutions, such as indispos'd them to unite, then they part and separate upon breaking the stone, as is observable in the Native minerals Bezoar and Geodes.

c. 37. a. A piece of a Flint, broken off to shew the interior Constitution of it. 'Tis of an oval Figure. In the Center of it is an oblong blackish oval Spot, which is surrounded with a Line of brown; and that encompass'd with a Line of white: the white with another of brown: and without all is a pretty thick crust of white. The others that I call Lines are indeed so many crusts, contained in one another: all of them passing the Substance of the stone, and being conspicuous in the same Manner and Order on the opposite Face of it; only the second Section is not thorough the central Nodule, but thorough the first crust. In this stone, the central Nodule has its Surface pretty smooth and regular: and the several crusts about it are, in all parts, of nearly the same uniform thickness. Hamstead-Heath.

c. 37. b. Another Flint, likewise broken. In the center 'tis brown: round that is a Circle of white: then one reddish mixt with white: after that, a very thin one of black: and lastly, a crust of white. Hamstead-Heath.

c. 37. c. A coarse Flint, of a triangular shape, broken also. 'Tis of an Ash-Colour, only about 4 of an Inch from the Surface is a triangular Line, about 1/2 of an Inch over in all Parts of it, of a reddish brown Colour. This lay near the former. I broke a vast many of the stones therabouts, and found them of like Constitution; consisting of crusts one within another.

c. 37. d. A Flint, broken. The middle part is of a pale brown Colour. Next that is a crust of white: then a crust of dark brown: and without all a thin skin of white. The two crusts, and skin, are each in all Parts of them nearly of the same thickness. Cane-Wood, near Highgate.

c. 37. e. Another. In the middle is a large round Spot of grey with a Coft of green. This is surrounded with a pretty broad Circle of yellow. Without all is a crust of brown. The Surface of the central Spot or Nodule is pretty smooth and regular: and the two crusts (for in reality that, which with such a Section of the stone appears only as a Circle, is part of a crust) about it in all Parts of it nearly of the same thickness. Newington-Green, Middlesex.
Another. In the middle is a Spot of a Grey, pellucid, or horney Constitution. Without that, is a thick Crust, opaque, and of a pale brown Colour. Found in a Corn-field near Northfleet, Kent.

A small Flinty Pebble, broken so as to discover the interior Constitution of it. In the Center is an oval white Spot, as it appears in the Plane of the Segment of the Stone, but is indeed a Nucleus. Round this appears a blackish or rather a deep grey oval Ring, which is an oval Crust, including that Nucleus; 'tis about \( \frac{1}{10} \) of an Inch thick. Without this is an oval Ring or Crust of white, like that of the Nucleus, \( \frac{1}{10} \) of an Inch thick. Lastly, without all, is an oval Crust of the same deep grey again \( \frac{1}{8} \) of an Inch over. Found in a Gravel-Pit in St. George's-Fields, Southwark.

Another broken in like manner. In the Center is a red oblong Nucleus. This is invested with a black Crust. That Crust is surrounded with a grey Crust. Then a black Crust again: next a grey; and so on to the Surface alternately; there being in all eight of these Crusts, \( \text{viz.} \) four of each Colour. The Crusts are each in all Parts nearly of the same thickness, their Figure suited to the Nucleus, and the outer Surface of the Stone exactly of the same Form with that of the Nucleus.

Another almost opaque, but thick set with Crusts of various and uncertain Figures encompassing one another. Found near Malden, in Essex. Mr. Buddle.

Another with like Crusts. This is somewhat more transparent, and one half of it has an Eye of red. From the Shores of the Bishoprick of Durham.

Several like pellucid, lineated or crusted Pebbles. Some of them are besides spotted and streaked with red, yellow, and white. Found in several Places on the same Shores.

A black Flint, cut and polished. In the middle of it are several Lines of grey and white alternately, which appear very beautiful and fine, especially as being so bevel and environ'd with black. Gravesend, Kent.

A Flint elegantly diversify'd with Stripes of a dark brown near black, and grey, alternately. The darker Stripes are not so broad as the grey ones. Shooters Hill, Kent.

A Plate cut off the foregoing, and polish'd. It takes a good Polish: and being held betwixt the Eye and the Light, the darker Stripes appear to be transparent.

A Plate off an Agate, with a Series of Stripes, white and blackish alternately, passing the middle of it. Gaddesden magna, Hertfordshire.

A Flinty Pebble, the Ground grey, with an Eye of green, striped with white and yellow. It takes a good Polish. Greenwich Park.

Another, the Ground much the same, but in some Places clouded with yellow. 'Tis striped with red and white. The
Stripes run round into an oblong oval Form, and environ one another. Indeed they are properly Crusts within one another, and seem to be made by a successive Application of different Matter as it came to hand in the Formation of the Body, beginning at the Center, and so concreting and crustling successively Crust upon Crust, the diversity of the Matter that came on in course, causing the diversity of Circles and Colours. Found in the Road near Bromly in Kent.

c.46. A Plate cut off the foregoing Stone, and polish'd, with good Success.

c.47. A Flinty Pebble black without, lineated within with Stripes of white, yellow and red, encircling one another, the innermost surrounding and including a dark blue Spot. Found in the Road near Deptford.

c.48. A Plate cut off the same, and polish'd with good Success.

c.49. Another Plate having a Spot of blue near the middle of it, and that surrounded with red and white Stripes alternately. On one side is a Line of yellow. It has taken a good Polish. This was cut off a very large Flint Pebble, found on Hamstead-Heath.

c.50. A Plate beautifully striped and clouded with Purple, dark red, and yellow. It takes a fine Polish. The Stone was found, on the Brow of the Hill, near the Mill on the Edge of Hamstead-Heath.

c.51. Another Plate. It has a bright brown Spot in the middle, environ'd with a white, and that with a brown Circle, and so on alternately several Rounds. Found in a Gravel-pit, not far from the Bowling-Green on Hamstead-Heath.

c.52. Another small round Plate, the Ground grey. In the middle is a Spot of yellow, surrounded with a Circle of red, that with one of white, and that with one of yellow, and without that are Circles of purple, blue, and yellow, but all very faint. 'Tis very beautiful, and the Polish fine. Found in the Gravel-Pit near the Bowling-Green. Hamstead-Heath.

The forty four following Flinty Pebbles, beginning with No 53. and ending with No 96 inclusively, are variously clouded, spotted, and striped or lineated, the Lines generally encircling and within one another, tho' variously disposed and figured. The Colours of the Spots, and Lines are very various, blue, yellow, brown, red, grey, and white. These I mention are the Colours of the interior Parts, the Bodies being broken to shew the inner Constitution of them, which is very close, and hard, so that they are capable of a good Polish.


c.54. Another, found in the Gravel-Pit, near the Bowling-Green, on Hamstead-Heath.

c.55. A Plate, cut off a Flinty Pebble. Found in a Gravel-Pit, amongst the new Buildings by Dover-street, near St. James's.
Another. Found in Greenwich-Fark.

Another. Found in the Road, a little on this Side Hamfleed.

Another. Found at the Foot of the Hill, about a Mile on this Side Hamfleed.

Another. Found in the Road, a little on this Side Hamfleed.

Another. Found in the Road, a little beyond Kentifh-Town.

A large oval Plate, cut off a Flinty Peble. Found in a Gravel-Pit, near the Bowling-Green on Hamfleed-Heath. It takes a good Polish, and is a very fine Stone.

Another, broke in two. From a Gravel-Pit near Gravesend. I once was in doubt, whether the blackifh Coats of these Flinty Pebles, (so common in Surrey, Kent, and Middleton,) were their original outmoff Coats. But View of this, of that, c. 97, and indeed those, c. 37. a. to c. 37. b. as also c. 58. c. 65. c. 77. and c. 90. with very many others that I have observ'd since, have satisf'y'd me that they really were. For these Coats, in Shape, nearly conform to the Lineation or Coats within. Which they never could possibly have done, had they been alter'd and worn by the Motion of Water, or the like, in Bodies of this irregular Form. In Bodies of a globofe Form, they might.

Another, broke in two. From still the fame Gravel-Pit.

The following Flinty Pebles, are very few of them striped, but spotted, and clouded very variously, and many of them in a very elegant and beautiful manner, with Black, Blue, Yellow, Red, Purple, White, Grey, and Brown. They begin with N° 97. and end with N° 129. inclusively. They are as firm, and capable of as fine a Polish as the other.

A Flinty Peble, spotted with Yellow. The Body of it is semi-pellucid. 'Tis cover'd with a very rough grey Cortex. Found in Kenfington Gravel-Pits.

Another, on one part flat; on the other convex; found near Woolwich. This has the Convex Part cover'd with a Crust, as the Outsides of these Bodies constantly are: but the flat has no Crust, but is in Constitution like that of the inner Subftance of these Bodies. And doubtles there was a natural Flaw and Crack there; at which the Body parted, and fell into two pieces. Such Cracks we frequently obferve in them, when lying in their Strata, and before any external Force could come at them to break them. And some there are that part at thofe Cracks, with the greatest ease imaginable. 'Tis likewise the Cafe of thofe, c. 180. c. 37. b. c. 37. a. c. 178. c. 179. c. 214. c. 233. c. 232. c. 251. c. 307. The grey Lines on the flat, enter not the Subftance; seem to be superficial, and owing to an external Agent.

Another, found in the Gravel of the King's-Bench Walks in the Temple. This seems to have been parted like that, c. 98. and the flat seems to have suffer'd by some external Agent, perhaps
haps Water; and to have been a little rough'd, perhaps by being
moved and slide'd on by the Water departing at the end of the
Deluge. I have commonly observed Flinty Pebles with their Flats
rough'd like this.

c. 106. Another, broken off No. 154.
c. 112*. A Plate cut off a Flinty Peble found near Greenwich, Kent. 'Tis an elegant Stone, hard, and the Polish admirable.
c. 113. Another. Found at the foot of the Hill, in the Road, a Mile on this side Hamstead.
c. 115. A Plate cut off a Peble. Found in the Road a little beyond Kentish-Town, Middlesex.
c. 117. Another. Found in the Gravel-Pit near Islington.
c. 129. A Flinty Peble, semidiaphanous, not unlike the Achate, the Ground grey, with Spots of Red; only towards the Surface it terminates in a Yellowish. Found in a Gravel-Pit near Gravesend, Kent.
c. c. 129*. A Piece of Flint, having, on one side, extremely small Sparks of Crystal: The other side, being polish'd, exhibits several Colours, chiefly red and white, finely intermix'd. The Stone nearly approaches a Jasper. Netleden, Buckinghamshire.
c. 130. Another, the Ground more pellucid, of an horny Appearance, and as fine as the East-Indian Agate. 'Tis spotted, like the two former, with red Spots. The Outside of this is smooth, clear, and shews the Spots at and underneath the Surface. Found near — — — in the Peak.
c. 131, 132. Two oval Plates, cut off the foregoing, and polish'd. They are of a very fine Polish, and beautiful Stones.
c. 135. An oval Plate cut off a Flinty Peble. Found in the Road about a Mile on this side Hamstead. It takes an admirable Polish: and is indeed a fine Stone.
c. 136. Another oval Plate, finely variegated with Red, Purple, Blue, a semidiaphanous Grey or Skye, Yellow, and Brown. The Polish is extraordinary. The Stone was found in the Road, on the Brow of the Hill about half a Mile on this side Hamstead.
c. 137. Another Plate, variegated with Blue, Grey, White, Red and Yellow, in an elegant manner. The Polish very good. The Stone off which this was cut, was found in a Gravel-Pit, near the Bowling-Green on Hamstead-Heath.
c. 138. Another Plate, variegated with White, a light Grey, a more duskey Grey, Yellow, and a few faint small Spots of Red. 'Tis finely polish'd. This, and that, No. 147. were both cut off the same Stone, which was found at the Foot of the Hill, in the Road, near a Mile on this side Hamstead.
c. 139. Another oval Plate, variegated with Yellow, Red, Pur-
ple, and White; the Colours very lively, and the Polish excellent. This was cut off the Stone, No. 154. infra, which was found in the same Road with the precedent, on the Brow of the Hill.
e. 140. Another oval Plate, variegated with White, Red, a pale Yellow or Straw-Colour, and Brown, with a faint Eye of Green. The Polish is good. The Stone was found, in the Road, a little beyond Kentish-Town.

c. 141. Another oval Plate, variegated with a semidiaphanous Grey, Red, Yellowish, and Brown. The Polish is extraordinary, and 'tis indeed a fine Stone. Found in a Lane about a Mile on this side Hamstead.

c. 142*. A Flinty Pebble, cut and polished; variegated with Red, Yellow, and White. Found, in the Road, about a Mile West of the Church of Gaddesden Magna, Hertfordshire.

c. 143. Another Flinty Pebble, variegated in a very lovely manner, with a semipellucid Agat-like Grey, Red, and Yellow. Found on the Brow of the Hill, in the Road, a little on this side Hamstead.

e. 144, 145-. Two oval Plates cut off the foregoing Stone. The Polish is excellent, the Colours lively and distinct, and the Stones little inferior to any Indian Agat I have seen.

e. 146. Another oval Plate. The Ground a dark semipellucid Agaty-Grey, very like that of some Mochoa-Stones. There are a few Spots in it more clear and pellucid; and one pretty large, part of it being of an Opake White, and part of an Opake Ash-Colour. But what is most curious and observable, is, that there runs obliquely a Line (of about ¼ of an Inch in breadth) for almost the whole Length of the Stone; which seems to consist of several small Cells, much like those of an Honey-Comb, only considerably less. The Parietes, or Partitions of them, are white and opaque. They are filled with a grey semipellucid Matter, but in some parts darker, in others clearer, being indeed little different from that that constitutes the main Ground of the Stone. The Flinty Pebble, off which this Plate was cut, was found near Carlton, Kent.

c. 147. Another small oval Plate. On one part 'tis of a fine semipellucid Agat-like Grey; in the middle Yellow; that is succeeded by a Line of Red; and that by Spots of a darker and lighter Grey, and of Red. 'Tis a beautiful Stone, and bears a fine Polish. This was cut off the same Stone with the Plate No 138. supra.

c. 148. A very small Stone, cut into a convex Form on one side, and a flat on the other. The Basis is grey and opake, the Middle white and opake, and the upper Part of the Convex yellow and semipellucid. Hamstead-Heath. 'Twas originally of this Shape, and is only left as far as the polishing required.

c. 149. Another, of like sort and opake. The Basis White, the Top of a dark Ash-Colour. The Pebble off which this was cut, found on the top of Oak of Honour Hill, Surrey.

c. 150. A small white Stone, cut into an oblong Convex Shape, the Basis flat. 'Tis sprinkled with very small Spots of Red, and crossed obliquely with a Vein of the same Colour. It has taken
a fine Polish. The Peble was very little bigger than now 'tis cut. 'Twas found by the Brook-side near Lunsham, Kent.

c. 152. An oval Plate of a yellowish Brown, and clouded in some Parts with a darker Brown. 'Tis opaque, but takes an excellent Polish. Found in the Road, about a Mile on this side Deptford.

c. 154. A Flinty Peble, finely variegated with Purple, Red, White, Grey, Yellow, with a faint Cast of Blue and Green. Conf. N° 139. supra. That Plate being cut off this Stone: as also N° 166. that Stone being a piece of this.

Eleven Flinty Pbles; beginning with N° 156. and ending with N° 166. lineated like those N° 53, &c. supra.

c. 158. Another, from the same Pit.

c. 161. Another, broke into two Pieces. From the same Gravel-Pit.

c. 167. A Peble, of an oval Shape, the Colour very white, and its Surface very smooth. Found on the top of a Hill near Henly, Oxfordshire. This is of a Sparry Constitution, and apparently worn and rounded by Water. Conf. 27. supra, & 187. infrà, &c.

c. 168. Another, of a globular Form, but somewhat compressed; the Surface pretty smooth, and of a light whitish brown Colour. Found near Warwick.

c. 169. A Flint, of the same Shape, the Surface very smooth, and of a dark grey Colour. 'Tis whole, but seems to be semipellucid. Found in a Gravel-Pit in Hyde-Park.

c. 170. A Peble, round, and of a Figure more compressed. 'Tis of a dark yellow Colour. Kensington Gravel-Pit.

c. 174. A Piece of the common black Flint, broken, and wholly divested of its outer Crust. 'Tis glossy all over with a Brass-like shining Armature, like that of the Cornua Ammonis, and other like Bodies that are found in the Earth, together with the Pyrite. This was found in a Rivulet near Hockfon, Suffolk. Mr. Adam. Budde. All the Flints in the same Rivulet were tinged with the same shining Glofs. Qu. Is the Water of this Rivulet impregnated with Vitriol? or are there any Pyrites in it?

c. 175. A black Flinty Pble, with several large white Spots, and one of a light brown. What is observable in this Stone is, that the Spots are of the same Colour throughout, even to the very Edges, there being an immediate Transition from White to Black, and the Colours not fading or declining gradually, and mixing as they approach each other. Found on Shooter's-Hill, Kent.

c. 176. An oblong, black, Flinty Peble, the Surface pretty smooth, and having on it three large yellowish Spots, of much the same Size and Figure, in both those respects much resembling a Garden-Bean.

c. 177. A dark grey semipellucid Flint. In one Part of it is a Delineation in white, not aptly resembling a human Face. The Marks of this sort are wholly contingent, and so scarcely worth notice.
notice: but there are those who set a Value upon them, so that I thought such not altogether to be neglected, and therefore mention this, and the two or three more that follow. Found near Clapham, Surrey.

**c. 178.** A yellowish *Flint*, with a greenish Cast. *Newington-Green.* There is naturally delineated upon it, in a pale Yellow, a Figure somewhat resembling a Scorpion, in an Hollow of the Stone. There's another broad Hollow on the opposite side of it. Conf. No 232. *infra.*

**c. 179.** A grey *Flint*, with a Figure in white, resembling a waved or flaming Scymeter. Found near Peckham, Surrey.

**c. 180.** A *Flinty Pebble*, of a dark grey Colour, with an Eye of Purple. There are upon it two Figures in white, like the Roman V. Found on Clapham-Common, Surrey.

**c. 182.** A large, flat, *Flinty Pebble*, the Ground black, undulated in a very elegant manner, and veined with White. The Veins are in all parts of near the same Diameter, and about \( \frac{1}{10} \) of an Inch over. Found on the Shores of Sheppy-Island.

**c. 183.** Another, likewise very curious, and little different from the former, only the Veins are somewhat larger. Found on the same Shores.

**c. 187.** A *Pebble*, of a pale brown Colour, veined pretty thick with small Lines of a yellowish brown Colour, variously intersecting one another. Found on a Hill near Henly upon Thames. The Surface of this is very smooth, excepting that the Veins rise, and are somewhat more prominent than the rest of the Surface, tho' but very little. This appears to have been smooth'd and rounded by Water.

**c. 191*.** Another, clouded with brown and a dark Red, and encompass'd with Zones of White; to which, in some parts of them, is superadded an Eye of Red. Found, near Sir John Mordant's Hospital, on Black-Heath.

**c. 192.** Another, of a reddish brown Colour. 'Tis surrounded with two Zones of White of about \( \frac{1}{10} \) of an Inch thick, nearly parallel to one another, and distant about \( \frac{1}{10} \) or \( \frac{1}{12} \) of an Inch from each other. They are indeed two white Plates, terminating in circular Lines or Zones at the Surface of the Stone; but passing quite through its Substance, as appears by the breaking and view of the interior Constitution of it. Found in the Road near Droitwich, Worcestershire. This seems to be worn by the Motion and Agitation of Water; which also I take to be the Case of *c. 188. c. *191. c. 198. c. 199. c. 200. c. 230. c. 298. c. 276.*

This, on a Review, appears to be, not a *Pebble*, but rather a Fragment of some hard Stratum, probably of Marble, broke off, and rounded, by the departing Water of the Deluge. Which seems also to be the Case of *c. 195, 196, 202.*

**c. 193.** A *Flinty Pebble*, surrounded with many parallel Lines, or Zones of White and Grey alternately. 'Tis broken, and the same Lines discover themselves within through the whole Substance of it.
it. So that the exterior ones are no more than the Terminus of the grey and white Plates, of which alternately this Body is compoied. Bromly, Kent.

c. 194. Another, very little different from the former. From a Gravel-Pit near Gravefend.

c. 194*. Another, not differing considerably from the two foregoing. The Surface of this is extremely smooth and polite. Found in a Gravel-Pit on Hamstead-Heath.

c. 195. Another, of the same Composition still, only the Plates are one of a whitifh, the other of a reddifh Brown, placed alternately. Found near Bewdly, Worcestershire.

c. 196. Another, little different from No 195. except that the Plates and Zones they end in, are broader. The Surface smooth for this sort of Peble. Found not far from the precedent.

The Zones are grey and yellow alternately. Shooter's-Hill.

c. 197. Another, of yet the same Composition. In this the Zones are grey and yellow alternately. Found in Greenwiche-Park.

c. 198. Another. The Zones white and brown. West-End, Middlesex.

c. 199. Another. The Zones grey and brown. The Surface exceeding smooth. Near Woolwich, Kent.

c. 200. Another. The Zones grey and yellowifh. Found in Greenwiche-Park.

c. 201. Another. The Zones white and a dark Grey. Greenwiche-Park.

c. 202. Another, of an oblong Figure. In the Middle 'tis encompass'd with Zones of Black and Brown alternately: at each End 'tis only Brown. The Surface is smooth for this sort of Peble. Near Bewdly, Worcestershire.

c. 203. A Peble, of an oblong Figure, surrounded alternately with Ridges and Furrows. The Ridges are composed of a Matter that is hard and polite, and of a darker brown Colour than the Furrows. Found near Bush-Hill, Middlesex.

'c. 203*. Another, little different from the precedent, only 'tis smaller. Islington.

c. 204. Another, of an oblong Figure, and brown Colour. One half of it is ridged as the former: the other smooth. Hyde-Park.

c. 205. Another, of a rounder Form; but encompass'd with Ridges and Furrows, tho' not quite so deep as the foregoing. Tis of a reddifh brown Colour. Fulham, Middlesex.

c. 206. Another, little different from No 205. only 'tis of an Ash-Colour. Kentifh-Town.

c. 207. Another, ridged in like manner. This has some degree of Diaphaneity. Black-Heath, near Deptford.

c. 208. Another, ridg'd also, and of a light brown Colour. Islington.

c. 209. A grey Flint, consisting of Plates variously apply'd to one another, their Extremities terminating in Ridges at the Surface of the Stone. Holloway, near Highgate.
A black Flinty Pebel, oblong, with several like Plates in the middle of it. **Isle of Man.**

Another, oblong also, of a pale brown Colour, composed entirely of like Plates. **Silverton, Devonshire.**

A Flinty Pebel, of dark grey Colour. In two or three Parts 'tis striped with Lines of White and the same Grey alternately. Found on **Black-Heath,** near Sir **John Mordant's Hospital.**

Another, very little different from the foregoing. **Northfleet, Kent.**

A Flinty Pebel, of dark grey Colour. In two or three Parts 'tis striped with Lines of White and the same Grey alternately. Found on **Black-Heath,** near Sir **John Mordant's Hospital.**

Another, oblong also, of a pale brown Colour, composed entirely of like Plates. **Silverton, Devonshire.**

Another, oblong also, of a pale brown Colour, composed entirely of like Plates. **Silverton, Devonshire.**

Another, very little different from the foregoing. **Northfleet, Kent.**

Another, Grey. At one end 'tis striped with small Lines of Grey and White. **Hamstead-Heath.**

Another, Grey with an Eye of Green. At one end 'tis striped with Lines of Grey and White. **Greenwich.**

A Flint of a light brown Colour. In one part of it is a Sinus, crossed with Lines of Yellow and Ash-Colour, alternately. **Iffington.**

A Piece of a Flint cover'd with a white Crust, which is ridged and furrowed, tho very slightly. Being broken, it appears within to consist in some parts of Plates, White, and a very light Grey; alternately: in others 'tis only of a dark Grey. It has some small degree of Diaphaneity. Found in a Gravel-Pit, at **Green-Hythe, Kent.**

A gritty Stone, of a reddish brown Colour, and globular Form. 'Tis about ¼ of an Inch in Diameter. From a Brook near **Otterton in Devonshire,** where there are great Numbers of them found.

Another, somewhat less. From the same Brook.

A Flint in shape of a small Pear. **Shooters-Hill.** At the lesser end, for half the length of it, 'tis White, the rest a dark Grey. There's a Stone in J. Bauhin's Book de Fonte Bollenfis, of much the same Figure and Size. He calls it Lapis Cinerus Cyrtoides Judaico similis: and has graved an Icon of it, p. 37.

A brown flinty Pebel of an oblong square Form, only the four Corners jet out into so many Prominences gradually lessening till they end in a blunt Point, and are all of much the same Size and Shape. Found in St. George's Fields, Southwark, in a Gravel-Pit.

A yellowish Pebel swelling out at one end in such manner, that it somewhat resembles one of the common pileated Mushrooms. The two parts appear as they would, had they been soft like Paste, and then stuck together. Taken up in **Hamstead-Town.**

An oblong compres'd greyish Pebel with a very rough Surface, only there are two parts very smooth, of a much darker Colour, and tho plain, yet raised above the ordinary Surface of the Stone; appearing like two Pieces of Plaister stuck upon it. These Parts are closer and harder than the rest of the Stone. **Tattenham-Court.**
t. 223. A Pebble of a light brown Colour, and oblong Shape, having two Appendages of the same Size and Shape, and opposite to each other jetting out on each side, about the middle of the Stone, so that it appears as if it were transfixed by a Bolt. Sheppey-Island, Kent.

c. 224. Another, of a somewhat paler Colour, beset with several Protuberances, appearing like so many Warts left and larger upon its Surface. Sydenham-Common, near Dulwich.

c. 225. A Flint of an oval Shape, an Inch and a half long, and about an Inch over. 'Tis somewhat flat, terminating all round in an Edge. On one side 'tis white, somewhat rough, and rises into a regular oval Convex. The other rises likewise, but not near so much, is very smooth, of a yellow Colour with a Cast of Green, and has a Line of White, about \( \frac{1}{12} \) of an Inch over, round the Edge. This was found in the great Gravel-pit on the East-side of Hyde-Park. I have seen several in the Gravel about this Town of the same Shape and Colours, but all less than this.

c. 226. A gritty Pebble of a very light brown Colour, an oblong oval Shape, an Inch and \( \frac{1}{2} \) in length, and one Inch in breadth, flatish, and having the two Ends somewhat pointed. There's a narrow Ridge, of the same breadth in all parts, running directly long-ways of the Stone, and quite encompassing it. This Ridge consists of a closer and harder sort of Matter than the rest of the Stone. In the middle on one side, the Stone sinks in, and rises out on the opposite, as if it had been soft and press't in that Part. Indeed it appears, upon the whole, as if it had been flat the quite contrary way of what it is at present, and the Ridge that now runs thorough the middle of the Flat, had terminated at the Edges of the Stone, till some exterior Force compress'd the two opposite Edges, brought it to the Form it now obtains, which indeed is very odd and extraordinary. Not but that it might originally have concreted into this Form, and perhaps it did. Where the ordinary Surface of the Stone sinks in, the Ridge yields in proportion. 'Tis not likely that this Ridge was extant at the first Formation of the Stone. Confer. No. 227. infra, but it appears very naturally as if it had been soft, and then press'd and wrought into the Shape it now bears. I found it in a Gravel-Pit amongst the New Buildings by Dover-street, St. James's, in the Year 1688. and 'twas the first Stone I ever took notice of, or gather'd. J. Bauhinus, de Fonte Bollenfi, p. 36. has an Icon of a Stone not unlike this. He gives it the Title of Lapis cinereus ovalis costa per medians longitudinem leviter surrettit.

c. 227. A flinty Pebble of a darker brown Colour, and firmer Consistence, but much the same Shape with the foregoing, tho' it be of size somewhat less. Instead of the Ridge, mention'd in the former, this has a whitishe Line environing of it length-ways, in like manner as the Ridge does that. This Line does not rise at all above the ordinary Surface, this Body being in all parts of the same Hardness. And possibly that which is now the Ridge
in that Stone, was originally not more raised than the rest of the Surface of the Stone, but being harder than the other parts of it; if the Stone was fretted or rubbed against other Bodies, 'tis certain the softer parts of it would yield soonest to the Attrition, and wear off the fastest; and this, more resisting the external Force upon it, would abide, and remain thus prominent, whilst the rest yielded, and wore off. 'Tis very certain, and there are multitudes of Instances in those Stones that are tumbled about upon the Shores by the Sea, agitated by the Tides and Storms, that the Parts that are softest wear fastest, and are hollow'd; whilst the harder, better enduring the Brun't, are prominent, and stand out above the others. The Stone, No. 226. lay in a Gravel-Pit, far from the Sea, or any River: and 'tis not likely but that it had lain quietly ever since 'twas first reposited there. But from Contemplation of this, and several others of like Constitution, Conf. No. 187, 203, & seq. uti & No. 222. 'tis evident that these Bodies have had their Surfaces ground, and worn, betwixt the Time that they were form'd in the Water of the Deluge, and that when they were reposited in the places where they are at this day found. Now that could never happen from any other Caufe, than the Hurry, Precipitation, and rapid Motion of the Water, returning, at the end of the Deluge, towards the Sea, and the Apertures of the Abyss, which are at the bottom of it. For, from several Observations that I have made, which shal be all deliver'd in their proper place, I find that the Force of the Water, so returning, was so great, as to tear up some of even the most solid Strata, and bear vast Masses of them with it, tumbling them along, rounding and smoothing them, and leaving many of them behind, when its Force began to abate; of which there are Instances in almost all parts of the World. Lesser Fragments, and Nodules, were more easily born away, and rounded. That they were really so, besides this Argument, of the harder parts of these Nodules commonly standing out, and being more prominent than the softer, where they consist of two sorts of Matter, the one more firm and solid than the other; I take the Smoothness of the Surface of some Pebbles and Flints, their original native rough Coats being worn off, to be a Proof of the same Thing. This Smoothness is very observable in the Surfaces of c. 167, 168, 169, 187, 192, *194, 196, 199, 202, all found in Gravel-Pits, or other Places where they had lain undisurb'd from the Time that they were first reposited there. And yet these have their Surfaces as smooth and polite as those, c. 186, 188, or any other that I ever met with upon the Shores, that had been ground and polish'd by the Agitation of the Sea. But there's yet another Phænomenon, that I take to be an undeniable Evidence of this Motion of the Water, and Attrition of the Stones hurry'd on by it. It is that the Nodules, that are made up of a Collection of smaller round Pebbles, of different Figures and Sizes, cemented together into one Mafs or Lump, I lay these Nodules have their Surfaces smooth. Thus in the No-
dale, No. 7. supra, taken forth of a Stratum of Gravel, and that is made up of many black, small, flinty Pebbles, held together by a yellowish Cement. tho all of them that are within the Stone, have some degree of Convexity, yet those at the Surface on all sides the Stone, terminate in a Flat that is coincident with the Plane of the Surface of the Nodule. Infomuch that on the outside it appears like a yellowish Pebble, spotted with black, the whole Surface being pretty smooth. The Stone is cut thorough the middle; by which means the Shapes of the Pebbles that compose it are very evident, and their Convexity manifest. And it must needs be granted, that Pebbles of that Shape could never by any Contra
tance whatever be so disposed as to constitute a Body with a plain even Surface. Indeed it might be so order'd, that only a small part of the Surface of the black Pebbles standing to the common Surface of the Nodule, the Interfices of the Pebbles might be fill'd up with the Matter that constitutes the Cement, and so the Surface be render'd smooth. But then the black Spots must be small, whereas in this the Diameters are as large, most of them, as the largest Diameters of the Bodies of the said Pebbles; which 'tis impossible they should, had only some small Portion of the Convex of them appear'd at the Surface of the Nodule. In short, they are as large as that Flat would be, after they were ground down to the Middle or Center. And indeed they appear here to have been ground so; for viewing the Face of the Stone where cut, the Pebbles at the Surface of the Nodule have their inner Surfaces, I mean those towards the Center of the Nodule, constantly convex; whereas those Surfaces that terminate at the Surface of the Nodule, are every where near plane. So that these are there, some of them, Half Spheres, others Half-Ovals, and the like; but there are none of such Figures in the Body, or interior Parts of the Nodule. In fine, at the Surface of the Nodule there are some few Pebbles of a firmer and closer Constitution than the rest; and these are more polite than those, and rise somewhat above the ordinary Surface of the Nodule, as having better maintain'd their ground, and endured the Attrition, than the rest could, that were not quite so hard. Upon the whole, here are so many Ev
dences that the Surface of this Body was originally uneven, and afterwards ground and wrought to a Plain, that the Thing cannot possibly be doubted of. Further Proofs of this we have in those, No. 8. & 10. supra, and other like Bodies consisting of Pebbles cemented and held together in one Mass.

c. 228. An oval Stone, of a brown Colour with a Cast of Green. It somewhat resembles a Walnut, divested of its outer green Coat, both in Size and Shape; and is, in like manner, divided into two equal Parts, by means of a Line passing length-ways round it. 'Tis smoother and more polite on the Parts on each side the Line than elsewhere, which indeed are now somewhat more prominent than the other parts of it, and appear formerly to have been yet more so, but ground and worn down by Attrition against some other...
other Bodies, by which means 'twas smoothed and polished. This is so evident from Inspection of the Stone itself, as not to be deny'd. Brompton, near Chelsea.

c. 229. A black flinty Pebble of a compressed Form; and, indeed, both in Form, and Bigness, resembling a Garden-Bean. Quite round the Edge of it runs a Line, \( \frac{1}{2} \) of an Inch in breadth, and of a yellow Colour, with an Eye of Green. Gravel-Pit in St. James's Park.

c. 230. A triangular flinty Pebble, of a dark grey Colour, with a Cast of Green. It rises on each side into a Convexity. There runs quite round the Edges, and by the Angles of it, a Line of a yellow Colour, and about \( \frac{1}{2} \) of an Inch in breadth. There's also on the more convex side a part bunching out a little, of a yellow Colour with a higher Cast of Green. This, and the Line round the Edges, are smoother than any other part of the Stone, and seem to have been ground down, thorough the exterior Coat; till the inner Constitution of the Stone appears. [Let it be cut, in order to discover whether it be yellow throughout.] 'Twas found in a Gravel-Pit in St. George's-Fields, Southwark.

c. 231. A Pebble of a light brown Colour, and of a gritty coarse Constitution. 'Tis encompassed with two parallel Lines of about \( \frac{1}{4} \) of an Inch in breadth, and at the Distance of \( \frac{1}{4} \) of an Inch from each other. These Lines are more prominent, and polite, than the rest of the Surface of the Stone; and of a firmer and closer Constitution. Indeed the whole seems to have been ground and worn, which these have endured better than the other less firm Parts, and so are more rising and prominent than they are. Gravel-Pit on this side Hyde-Park.

c. 232. A flinty Pebble, having six roundish Cavities in it, pierced through the Coats of the Stone to the medullar Parts of it; where 'tis of a dark green Colour. The exterior Cortex is of a Foliomort Colour. The next under that a whitish brown. Then a Foliomort again. And, lastly, the green Substance. These Cavities do not appear to have been caused by any breach of the Stone; but are as if six other Bodies had been contiguous to it whilst it was in Formation, and hindered the successive Application of the Matter, in order to the Continuation of the Crusts in those Parts or Cavities. Conf. No 178. supra. Kentish-Town.

c. 233. A Pebble of a round compressed Form, the exterior Surface very rough, of a brown Colour with Spots of yellow. There is a semilunar Cavity (naturally) in it, that is of the same Colour, but much smoother than the Surface. St. George's-Fields, Southwark.

c. 234. A small, black, flinty Pebble, of much the same Shape with the former. The Surface is black, with a Spot of yellow. It has (naturally) a Cavity in it, smoother than the Surface. Found at the Foot of Shooters-Hill.

c. 234. A Flint, the outer Coat of an horney Grey, with some degree of Diaphaneity, like an Agat; the inner of an Ash-Colour, and.
and opaque. In the middle is a clear Crystalline Matter, shot in some parts, where there was room, into hexagonal pointed Crystals. I have elsewire set forth thofe Observations on Flints; and Agates, from which it appears that the Parts of these Bodies, that have an horney Diaphaneity, owe it to an Admixture of Crystal incorporated with the common Mafs of the Stone. This was found near Purfleet, Essex. I have feen feveral Flints, that, when broke, had Cavities within, thick fet on all sides with fine hexagonal Crystall Shoots, and after the manner of the concave Crystalline Balls; and fome very fair, and pretty large.

c. 245. A Peble of a light brown Colour. In one part of it the Surface is somewhat depreff’d; and there, upon a Plane, are feveral small oblong Studds, each near as big as a Rape-Seed, placed regularly in a Quincunx Order, at the Diftance of about 1/20 of an Inch from each other. The Plane is near square; and there are nine Rows of the Studds each way, from fide to fide. On one fide of the Square the Stone is broken, and seems to be worn away on another; fo that how far the faid Plane might originally extend, is not to be known. ’Twas found in a Gravel-Pit amidst the New Buildings near Dover-street, St. James’s. The Studds of this are smooth at top, and not abrupt; nor have they any appearance of being broken off from any thing else; which thofe of the following manifestly have.

c. 246. A grey Flint with a brownifh Coat; the outer Coat grey. ’Tis fplit in two; and in one Piece are very many Studds, somewhat larger than thofe of No. 245, and fet clofer together. They fand in an Order approaching a Quincunx, tho not quite fo regular as in the foregoing. They are abrupt at top; and were originally continuous to the oppofite Piece. The Surface, or Plane, whereon they are planted, is depreff’d in three places, and rises gently in the Intervals. The Depreffions, and Rifes, are ftreight, and parallel. Whether there were not more of them; or how far the Plane extended, does not appear, this being only a piece of the Flint, and is entirely fuddled over. In the oppofite piece of the Flint are feveral little Cavities, into which the Studds were implanted. The Intervals of the Cavities, rising a little, make a pretty kind of reticulated Work. The Surface of the Plane in this rises alternately, and is depreff’d fo, as to tally with, and answer the other. Found in a Corn-Field, near the Thames, by Gravesend.

c. 247. A brown Flint of a Conic Figure. The Basis is oblong, being one Inch and a quarter long-ways, and near an Inch across; and is somewhat depreff’d or hollow’d gradually towards the middle of it. Round the Edges of the Basis are two Ranks of Cavities, in each of which is placed a roundish Studd, about the bignefs of a Grain of Millet. The Studds have their Surface punctulated, as if fet all over with other Studds infinitely lefs. Near the Apex, or Top of the Cone, is a Corona or Circle of the fame fort of Studds, but much broader, there being more of them in some
some parts than in others. The Studds are of a much darker brown than the rest of the Surface of the Stone; and they being punctulated, and the ordinary Surface smooth, make the whole a very extraordinary Object. This I found in a Gravel-Pit near Cambridge. A very small piece of this Flint is broken off, which discovers it to be of a whitish grey Colour, very polite, and of a firm close Constitution within. *Vid. No. 252. infra.*

c. 248. Another, of like Figure, but much larger. This is covered all over with a grey Crust; and has two Fragments of Spines of some sort of marine *Echinus* adhering to the Surface of it. Round the Edges of the Base of it is a Line of an Inch in breadth, thick set with small Pores, and Studds, and there are some large flat Ridges running irregularly a-cross it. The Top of the Cone is cover’d with a Spot, rather inclining towards one side of the Body, of an Inch in Diameter, studded and porous, for the main, like the Line round the Basis. Found in a Corn-Field near Green-Hythe, Kent.

c. 249. A dusky brown Flint, of a Conic Figure, but rounder and more slender, and having the Base less than either of the former. 'Tis about an Inch and a half long; and an Inch in Diameter. Round the Edges of the Base runs a Line about a quarter of an Inch over, and of a paler Colour than that of the rest of the Body. It sinks in for about 5\(^4\) of an Inch, as if the Surface had been graved, and the Stone cut into by a Tool. The Margins of it, on each side, do not terminate in a straight Line, but are indented, each Indentation being continued in a small Ridge a-cross the Line to the Indentation that answers it on the opposite Margin. They are towards the Edge of the Base a little effaced, as if fretted or worn down. Round the Apex at top, 'tis encircled with a Line or *Corona* of much the same Breadth, and Work, as that at the Base. *Hamstead-Heath.*

c. 250. A small grey Flint, cover’d with a whitish Crust, and of a Conic Shape; only the Basis is somewhat convex, and the Apex of the Cone not directly in the middle, but inclining towards one side of the Body. Round the Basis runs a Line undulating to and again, not unlike a Suture in a Skull. With a little Force the Body parted in two at this Line, the Cohesion being flight, and only an inconsiderable part of the Flint broke. The lower piece within is furrow’d pretty deep, and ridged alternately, the Ridges gradually rising and running up into an Apex or Cone in the middle. The upper Piece has a conic Cavity, ridged and furrowed in such manner as to admit and tally with the other. Found in a Stratum of Chalk about fifty Foot deep, in the great Chalk-pit at Northfleet, Kent.

c. 251. A Flint, cover’d with a dark grey Crust. On one part of the Surface is a Line of a pale brown Colour, about 3\(^4\) of an Inch over, and sinking near half as much below the Surface. 'Tis undulated to and again, so that the Body in that part appears much like
like the Cerebellum of a Man. Found on Gogmagog-Hills, near Cambridge.
c. 251. Another, with the Surface undulated in like manner. Found near Cambridge.
c. 252. A greyish brown Flint, of an obtuse conic Figure; an Inch in Diameter at the Base, and about 4 of an Inch in height. In the middle of the Base is a round Flat about 10 of an Inch over, and somewhat raised above the rest of the Base. The whole Surface besides is very rough, being thick set with very small Pores, excepting certain smooth Ridges that run into one another, so as to constitute an elegant reticulated Work upon it. Found near Rumford in Essex. This somewhat resembles a sort of Echinus we meet with frequently in our Chalk-Pits; as that No 247. does another; tho there's no reason to think they either of them owe their Form to a Shell.
c. 253. Another Flint, of much the same Colour. A great part of the Surface rises into Ridges, which are so disposed, that the whole not unaptly resembles the Surface of the Brain of some sorts of Fowls. Found in a Gravel-Pit in St. George’s-Fields, Southwark. The Intervals, or those parts that lie betwixt the Ridges, are rough and porous, much as in the foregoing.
c. 254. A Flint of a Cylindric Figure, only lessening a little toward each end. 'Tis three Inches long, and one Inch and a half in Diameter. There runs thro the whole length of it a cylindric Cavity, of about half an Inch in Diameter. The Surface without is of a whitish; that of the Cavity yellow. The Substant of it, where broken, is grey. Found in a Gravel-Pit near Greenhithe, Kent.
c. 255. Another of like Shape in all regards, but somewhat shorter. The exterior Surface of this is of a yellowish brown Colour; and the cylindric Cavity larger than that of the foregoing. Found in a Gravel on the back-side of Golden-Square.
c. 256. Another, little different in any respect, only 'tis considerably less than either of the former. Found in the same Pit with No 255.
c. 257. A Flint, brown, with a Cast of Green. It consists of three round Stems or Branches concurring in the middle. There is a Hole at the Extremity of each Branch, passing on to the middle of the Stone, where all three Cavities communicate together. So that this Stone is no other than a triple-branch'd fistulous flinty Crust. Besides that, at the end, in the side of one of the Branches, which is somewhat longer than either of the rest, are two pretty large Holes opening into the Cavity of the Branch. Found, among Gravel, near Marybone, Middlesex.
c. 258. An orbicular grey Flint, about three quarters of an Inch in Diameter. In the middle of it is a spherical Cavity, lined with a cretaceous Matter. This was found in a Chalk-Pit near Charlton, in Kent. These flinty Shells are pretty frequently found. Their Cavities are sometimes empty, sometimes filled
with Chalk *, and sometimes with a somewhat harder white Body †, which, if loose, so as to rattle when the Stone is shaken, is what the Antients call \textit{Aeris}. I have met with these several sorts in the Chalk-Pits of Surrey, Kent, Essex, and Hertfordshire, from the bigness of a Pea, to the Diameter of four Inches.

\section*{c.259.} An orbicular brown \textit{Flint}, somewhat less than the former. There's a spheric Cavity in the middle of it; and a round Hole (naturally) from the Surface passing into that Cavity. Iflington.

\section*{c.263.} A large piece of a concave flinty Ball. The Coat without is brownish, and very rough and uneven. The inside rises up into fine pellucid Bubbles not unlike thofe of Frog-spawn, of different Sizes. They indeed very much resemble the \textit{botryoid Tubera} on the \textit{Hamatites}. Vid. \textit{Clafs 14. No.42.} Found in a Gravel-Pit on this side Tatum-Court, along with No. 7. supra. One of the Bubbles being broken, difcovers a Texture within, very like that of the \textit{Hamatites}; (vid. \textit{Clafs 14. 0.42.}) and is in like manner striated too: but the \textit{Striae} in this are extremely fine and small.

*Tis true, the Bubbles of the \textit{Hamatites} are outwards, and upon the convex of them; and these of the \textit{Flints} on the inside, and concave part: but that's a variety we fee frequently happening to the very fame sort of Matter. Witness the echinated cryftalline Sails, on which the Cryftals rise out of the Convex; and the concave cryftalline Balls, where they are all on the concave part. Nay, both these are found in the fame Place, or Ground, too.

\section*{c.264.} Another, little different, only the Bubbles are scarcely so clear, having in them a flight Tincture of Yellow. Found in a Gravel-Pit in St. George's Fields.

\section*{c.265.} Another Gravel-Pit in Hyde-Park. The Bubbles of this have their Surfaces glittering, and frofted over with extreme small cryftal Sparks. There are Sparks very like these obserable on fome Samples of the \textit{Hamatites}; particularly on one part of that \textit{Clafs 14. o. 55.}

\section*{c.266.} A large black \textit{Flint}, with a white Coat. Being broke in two, there appears in the middle of it an oval Cavity, two Inches in length, and an Inch and half a-crofs. There passes a Cylinder of \textit{Flint}, a quarter of an Inch in Diameter, through the whole length of the Cavity, and incorporates with the \textit{Flint} at each end of that Cavity. And at one end of it arises a flinty String, of \(\frac{1}{10}\) of an Inch in thickness, which wreathing itself five times spirally about the Cylinder, is inferted into the \textit{Flint} at the other end of the Cavity. The \textit{Flint} constituting the Body of the

\* Bodies thus charged with other Matter are call'd \textit{Prades}, by Dioscorides, and other antient Naturalists.

† This the Antients call'd \textit{Callimus}.
Stone, of the Cylinder, and the String about it, is all of the same Colour and Substance. The Inside of the Cavity is lined, and the Cylinder and String invested, with a white flinty Coat, frosted over, in all of them, with very fine small Sparks of Crystal. Out of a Chalk-Pit, by Purfleet, Essex.

c. 267. Another large grey Flint, with a like Cavity, and Cylinder passing long-ways of it. There's a like String also spirally wreathed about it, tho (in this) only three times. The Cavity, Cylinder, and String, are cover'd with a white Coat, frosted over with crystalline Sparks, but smaller and less conspicuous than in the foregoing. Found in a Field between Cashalton and Bennington, in Surrey.

c. 268. A yellowish brown Flint, near round, and about three Inches and a half in Diameter, the Surface somewhat tuberose and uneven. In the middle is a Cavity, with a hard Body lying loose in it, and rattling when the Stone is shaken. This is a sort of Aëtites, or Eagle-stone. Kentish-Town.

There's another Aëtites, c. 299. infra. See also c. 306.

c. 269. A roundish Flint, outwardly brown; inwardly, as appears by a little Bit struck off, it is of a deep grey, near black. It is about two Inches in Diameter, and of the Aëtites kind; discovering a Callimus in the middle of it when shaken. I found this on the plough'd Lands near Marlborough, in Wiltshire.

c. 270. A round Flint, about the bigness of a Walnut. 'Tis of a brown Colour, with a Cast of green. There's a pretty deep Furrow running in manner of a Zone round the middle of it; the Surface, on each side of the Zone, for a little space, being porous and uneven. Dr. Prideaux found this amongst the Gravel in the Walks of his Garden at Norwich. This also is an Aëtites.

c. 271. Another, very round, and smooth. 'Tis of a pale brown Colour. The loose Stone within is very hard, as appears from the brisk Noise it makes when shaken. Mr. Morton. Found in Hertfordshire.

Another, a little different from the precedent; only less, and of a deep Colour, near black. Found near Uxbridge.

c. 272. A roundish Flint, of a very dark brown Colour. In the middle of it is a large Cavity, into which there pafs two Holes from the Surface. In the said Cavity lies loose the Shell of some sort of Bivalve, larger than could be introduced in at either of those Holes. Taken out of a Cliff, near Dover.

c. 273. A blackish flinty Pebble, in shape very much resembling a human Heart. The Baxis has several Foramina, appearing not unlike the Cavities of the Blood-Vessels cut off at their Rise out of the Heart. 'Tis two Inches and a quarter in length. Found upon the Strand near the Pier at Dover.

c. 275. A small flinty Pebble, which being broken, discovers a porous scabrous Nucleus in the middle of it, which is contain'd in a grey Crust, a quarter of an Inch in Thickness, and that involved in another of a yellow Colour, 1/20 of an Inch thick. The Cousts
Crufts including the Nucleus are of a close flinty Texture. Found in a Gravel-Pit in St. George's-Fields, Southwark.

c. 276. A Pebble about the bigness of a small Walnut, of a brownish yellow in most places; but where the outward Cruft has been worn off, it appears of a very light yellow. It has some degree of Transparency; and in the whole resembles very much a piece of Amber. Epping-Forest, near Lord Castlemain's House.

c. 277. A Flint with some degree of Diaphaneity in all parts, but the middle of it is very diaphanous, with some small Spots of red. This is surrounded with a Cruft of brown, set pretty thick with grey Spots. Found in St. George's-Fields, Southwark.

c. 278. An oval Plate cut off the foregoing, which takes a fine Polish.

c. 280. A Plate, cut off a flinty Pebble found near Ijlington. It takes a good Polish. There's a cellular Texture in this finely shewn; and 'tis a beautiful Stone.

c. 282. A Plate, cut off a Flint having some degree of Diaphaneity. The Ground of it is red, and thick set with Spots of yellow. Found in St. George's Fields, Southwark.

c. 283. A Flint cut into the Form of a Knife-haft. 'Tis partly diaphanous, and besides, shews a beautiful Mixture of Colours, being variegated with white, yellow, green, brown, red and purple. 'Tis very hard, bears a good Polish, and is as fair an Agate as is generally seen.

c. 285. A Plate cut off a flinty Pebble semi-pellucid, the middle part of it is grey, thick set with black Spots, and some few white. Round this are Streaks and Spots of red, white, and yellow, in a Ground of a lightish brown Colour, with a Blush of Green. Found in the Road to Hamstead, half a Mile on this side the Town.

c. 287. A Plate, cut off a flinty Pebble; the greater part of the Ground of a deep grey, approaching black, finely variegated with red, yellow, purple, and white.

c. 290. An oval Plate, cut off a flinty Pebble, variegated with grey, white, yellow, purple; with a good Polish. The Stone found in the Road near Hamstead.

c. 294. An oval Plate, cut off a flinty Pebble found on Hamstead-Heath. 'Tis finely variegated with white, purple, red, yellow, and brown; and takes an excellent Polish.

c. 295. Another, semi-pellucid; the Ground an horney grey, but having in some parts a Cast of Yellow. There are in it five or six white Streaks or Plumes, lying parallel to each other, and passing a-crofs the Plate. The Polish is very good. The flinty Pebble off which it was cut, was found likewise on Hamstead-Heath.

c. 296. Another Plate very beautiful, and its Polish admirable. 'Tis variegated in a very lovely manner with white, red, purple, and yellow. From the same Heath.
c. 297. One half of a Flint, that was of a shape near orbicular. Tis hollow, and lined with Spar, shot into Crystals, pellucid, and very small. Without these is a flinty Crust of a pale brown Colour, 1/4 of an Inch in thickness; and, over all, another Crust, somewhat paler, and 1/8 of an Inch thick. The Body itself is two Inches and a half in Diameter. Greenhythe.

c. 298. A flinty Pebble, of a compress'd flat shape, almost triangular. The three Corners are of a pale yellow Colour; the rest of the Surface of a reddish brown. Found near Hackney.

c. 299. A Flint, of a light brown Colour, pretty round, on the Surface smooth, except that there are some small Cavities in it. It is about an Inch and half in Diameter. It is of the Ætites Kind, having a loose Callimus in it, which rattles and makes a noise upon shaking the Stone. Found near Marybone, Middlesex.

c. 300. A Pair of Stones, cut Diamond-wise, polished, and fit to set. They are transparent, clear, and of a good Water. They were cut both out of the same Flint; which was found near Ashburn, in the Peak.

c. 301. A small oval Plate, cut off a flinty Pebble, and polished. The Politure is very good; and tis prettily variegated with a pale grey, blue, yellow, and purple. Found in the Gravel-Pit at the Top of the Hill, near the Town, on Hampstead-Heath.

c. 302. Another like Plate, with much the same Colours, but variegated in a different manner. The Stone found in the Road betwixt Deptford and Southwark.

c. 303. Another, with like Colours, only the Yellow is darker, with a Cast of Green. The Stone off which it was cut, was found along with the precedent.

c. 304. Seven and twenty flinty Pebbles cut into oval Figures, and polish'd. They are hardly so big as Pigeons Eggs. Several of them are of the Agat kind; and of a fine corneous, or semipellucid Grey. The rest are most curiously variegated with almost all sorts of Colours. They were found in several Parts, of Surrey and Middlesex, near London. The Design of preserving these, is to shew the inner Constitution of this sort of Stone, when thus cut, and laid open to view; and the Method and Process in the Formation of it.

c. 305. An oval Plate, cut off a flinty Pebble. Found on Winchmore-Hill, not far from Southgate, Epping-Forrest. The Ground of this Plate is of a light grey Colour; but is spotted with a darker grey, and with black. One of the black Spots is long, slender, and, as the Lapidary fancies, resembles a Dagger, or Bayonet. Towards one end is seen a pretty Intermixture of red and yellow.

c. 306. A small round Flint, broken so as to shew 'tis compos'd of three Crufts or Spheres; the outermost white, the next corneous, and the innermost white. In the Center is a Cavity, in which is a Core of a grey Colour, affix'd on one side to the innermost Cruft. Had this been loose, as they frequently are, it would...
would have shoo'd; and then the Body would have been call'd an ætites, of which fort it truly is. Deptford.

c. 307. A black Flint, cover'd with a white Crust, off which Flakes seem to have started in several parts of the Surface, most of which have left small Cavities, in figure of a Crescent or Half-Moon. Found, amongst several others that had like semilunar Cavities, near Cambridge.

c. 308. A small Pebble, yellow, with numerous small Specks of red. From the Shores near Whitehaven.

c. 309. Another, of a dusky red Colour, with small Specks of a brighter red. From the same Shores.

c. 310. A Plate cut off a flinty Pebble. Found on Hampstead-Heath, finely variegated with yellow, white, and red.

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CLASS IV.
Talc and Talky Bodies.

PART I.

EXTRACT.

A Classical Distribution of the Talky Bodies according to their Figures, Textures, and Relations to each other. Part I.

Talc differs from all other native Fossils in this, that it is flexible and elastic; and all Talky Bodies are so more or less, answerable to the greater or less Quantity of the Talc they have in them. Part I.

Talc in Ragstone, b. 70.
— in blue Slate, b. 80.
— in the Piped-waxen Vein, *d. 9.

Talc in Black-Lead, Part I.
— in various other Fossils. See the Index of the first Part of this Class.

CLASS IV.
Talc and Talky Bodies.

PREFACE.

These are either, 1st, Regular in their Texture and internal Constitution; but not in their exterior Figure. As, 1. The fibrous or filamentose Bodies, which are composed of parallel Threads. 2. The
2. The piped-waxen Vein, that is composed of parallel Tubules.

3. The Ludus Halmontii, which is composed of Talky Plates forming Cells, that are filled with stoney Matter. 4. Talc and the Mi-ca, which are composed of parallel Plates; all which Bodies have their exterior Surfaces irregular and uncertain. Or, 2dly, Regular, both in their internal Constitution, and in their external Figure: As, 1. The Selenites, which is composed of parallel Plates, and is externally of a Rhomboid Figure. 2. The Belemnites, which is composed of various Cortices including one another, and is externally of a Conoid Figure.

One Property Talc has that is peculiar, and in which it differs from all other Native Fossils: which is, that it is flexible and elastic, being disposed to bend; but return to its original posture as soon as the Force that bends it is withdrawn. The same Property is observed in all Talky Bodies; but more or less, according as they contain more or less Talky Matter in them. The Plates of the Selenites, and Threads of the fibrous Bodies, Class 4. Part 2, bend much more easily than the Talky Spar; and the Septa of the Ludus Halmontii, the Pipes of the piped-waxen Vein, and the Cortices of the Belemnites, have so little Talc incorporated with the Spar that composes them, that it is no wonder they are not flexible.

Wadd or Black-Lead apparently holds a considerable Proportion of Talc in it; and the finer parts of it, when cut into thin Plates, or into Threads, bends, and is elastic. The Talky Sorts of Slate, such as that b. 8o. supra, have likewise some small degree of Flexibility and Elasticity. This elastic Disposition discriminates the Talky Fossils from all others that are Native. Indeed there are none besides that are flexible, except only the Virgin Metals; and they are not elastic.

CLASS IV. PART I.
The squamous or foliaceous Talc and Mica.
Conf. Class 4. P. I.

EXTRACT.

C. 1. The several Names given to these Bodies by Writers and others.

Lapis Specularis, Ising-Glas, or Muscovy-Glas, along with a black glossy Talc, in a sparry semi-pellucid Stone, Θ d. 1.

Talc like the Venetian, Θ d. *7.

Galacicos Argyrodamanti similis, Plinii, Θ d. 27.

Wormseed-Stone, a Talky Body, related to the Porphyry Kind, Θ d. 36.

Granite,
Granite, like that from Arabia, Θ d. 38. *38. 38. Warming-stone, Θ d. 7.
Sulphur Earth, Θ d. 41.
Call, Θ d. 45.
Mica argentea, the white or silvery Mica; Glimmer, or Cat-Silver, Θ d. 1. 2. 4. 9. 10. *10. 20. 30. 31, & seq. to 39.
Mica aurea, the gilded or yellow Mica, Θ d. 16, & seq. 25. 42.
Mica grysea, the grey Mica, Θ d. 7. 28. 38. *38. 43.
Mica nigra, the black Mica, Θ d. 11. 12. 13. 14. 15. 16. 22. 23. 25. 44. 45.

C. 2. The various Bodies in which Talc is found,

Talc in a saline Earth, g. *3.
Talc in Loam, a. 100.
— in Sand, + a. 7.
— in Strata of Stone, b. 1. 31. 32. 60. Θ d. 14. 38. 39.
— in white Slate, or Flag, b. 85.
— in Stone mix'd with Coal, g. 16.
— in Marble, * b. 11. 19.
— in Geodes, + o. 10.
— in the Ludus Helmontii, x d. 5.
Talc in various other Fossils. See the Index of the general Reflections at the Head of this fourth Class.

Mica argentea, in Stone, Θ d. 4. 5. 9. *10. 31. 37.
— together with Spar, Θ d. *7. 29. 44.
— with Iron, Θ d. 44.
Mica aurea in Spar, Θ d. 16. 17.
— in a gritty friable Stone, Θ d. 20.
— in a hard Stone of a ferruginous Colour, and holding upon trial, Sulphur, and Tin, Θ d. 21.
Black Mica in Spar, Θ 11. 16. 22. 25.
— in Stone, Θ d. 12.
— mix'd with a white diaphanous Sand, Θ d. 23.
— suspected to hold Silver, Θ d. 45.

C. 3. Of the Uses of Talc.

Talc reducible to an impalpable Powder, of use in casting of Metals, Θ d. 14.
Of the Medical and Chirurgical Uses of Talc.
Of the Mechanical Uses of Talc.

C. 4. Of the Composition of Talc; and of its Origin and Formation.

Talc is, in specific Gravity, to Water, as 2. 6 to 1. It is flexible and elastic. In which it differs from all other Fossils; and, which
which is remarkable, somewhat approaches the Tenor of Animal and Vegetable Substances.

It ever concretes, and is form’d into Plates, or Flakes; in which likewise it agrees with Wood, Shells, Bones, and other vegetable and animal Substances.

The lesser Maffes of it, that are lodg’d in Sparry, Stoney, and other like Bodies, dispersely, from their shining and glimmering more than the other Parts of those Bodies, were an Inducement to the Writers of Fossils to give those Bodies the Name of Mica, and Glimmer.

These lesser Maffes do not differ from those that are larger, that have the Plates of greater Extent, and are commonly call’d Tale, in Constitution, or any other Respect, except only in Bigness.

Tale, when homogeneous, pure, and free from extraneous Mixtures, is of a white, silvery, Glossy Complexion: and the Plates of it are generally plain, smooth, and pellucid. Such is the Lapis Specularis, or that sort that is call’d Muscovy-Glaſs.

As to the yellow Tale, the Tryals I have hitherto had opportunity of making, have not inform’d me to what that Colour is owing: whether to the Accession of Sulphur, or of some Metal.

The black and grey Colours arise from an extraneous Stoney or Mineral Matter, that is so intimately mix’d and incorporated with the Talky, as being superior to it in Quantity, to give the form’d Maf’s not only a different Complexion, but even frequently a Tenor, Form, and Disposition, different from what the Talky Matter ever assumes, when pure and free from such Admixture.

The Maffes of the purer Tale, particularly those which are incorporated with Sparry Matter, consist of several Plates or Flakes set, Face to Face, contiguous to each other, \( \Theta d. 1 \).

The Talky Flakes in the Strata, were all form’d before the Subsidence: and settling down, along with the Sand, and other constituent Matter of the Strata, they became reposited amongst them. The Weight, Density, and Resistance of the Matter of those Strata is such, that the Talky Flakes could not have been form’d since the Compilation of the laxer Strata, e. gr. of Earth, Sand, and Gravel. And for those of Stone, Slate, and the like, their Solidity would be a still greater Obstacle to the Formation of the Talky Plates in them. Those Plates lie flatways, and parallel to the Site of the Strata, as all flat Bodies constantly do in the Strata: and indeed in the very manner that flat Bodies are wont to be reposited, as settling down from a Fluid, \( \Theta d. 1 \).

The Flakes of the Tale, found incorporated with the Spar, and Vein-Stones, in the perpendicular Fissures, are accommodated to the Tenor of those Bodies. This was all reposited originally amongst the common constituent Matter of the Strata, either
either in single Corpuscles, or Masses, so small as to pass the Interstices and Pores of the Stone; through which they, as indeed all the Matter now found in those Fissures *, were drain'd, in Tract of Time, by the Water that is continually passing thither, in order to the Supply of Springs and Rivers. Θ d. 11.

C. 5. The Places where the Talc and Mica are found.

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CLASS IV. PART I.

The squamous foliaceous Talc and Mica.

PREFACE.


* Nat. Hist. of the Earth, Part IV. Cons. 4.
None, of these which follow, in this Catalogue, are in Form of Nodule, or invested with a Crust. There are several, found on the Shores, that have been worn and rounded by the Agitation of the Sea: and one, [O d. 4.] found, among Gravel, in a Midland-Country, rounded by the Water of the Deluge departing; O d. 1. was out of a Vein, or perpendicular Fissure. Most of the rest were Parts of Strata.

Talcum & Mica. [O d.]

O d. 1. Part of a large white sparpy semipellucid Mass, found near Backwell in the Peak, containing, in several Parts of it, certain Masses of a white or silvery glossy Talc. Some of them are of a considerable Extent, the largest being an Inch and \( \frac{3}{4} \) in length, and an Inch broad. They easily split into thin transparent Lamina or Plates: and are of that sort of Body which is called by Pliny Lapis specularis, in the Shops Glasing-Glass, and Muscovy-Glass. In one part, the Sparry and Tacky Matter appear to be incorporated together, and equally mix'd. There are interposed in some parts of it, small, black, glossy Masses.

In this, and the Body O d. 30. the Plates of each distinct Mass lie parallel to one another: but the Masses themselves lie crofs, and in Postures as different as may be. Whereas in Stone, Slate, and other Bodies that lie in Strata, the Tacky Flakes lie parallel to the Surface of the Strata. Even those two Bodies O d. 10*, and O d. 28. that were found, tho' amongst Gravel, yet lying parallel to the Site of the Strata, have the Tacky Plates lying parallel to each other, and to the Surfaces of those Strata. And in those Masses that were found, beat off from the Strata upon the Shores, such as O d. 2, 5, 6. the Tacky Plates are disposed in the same Method. The reason of which will appear very plain to any one that knows that Pebles and Flints are of a crofs-grain'd Constitution: and break irregularly, and uncertainly, Conf. Pref. to Clas 3. Whereas the Stone of the Strata that has Tacky Plates in it, breaks with a Grain, and parallel to those Plates.

O d. 2. A Mass whitish, with a Cast of brown, thick set, in all parts, with small Spangles of Tale of the same sort with that of the precedent. From the Shores near Outhorn, Yorkshire. I have seen of the very same from the Shores of Humber, near Hull. This seems to be a sort of the Mica of Agricola *. The Germans call it Glimmer, and Catsilver; the English, Cat-silver: and indeed Mica Argentea may not be an improper Name to distinguish it from the yellow sort, which the Mineralists call Mica aurea.

* In Bermanno, p. 696. “Quiddam candidum Scintillarum modo in hoc lapide lucet.—Colore Argento simile sit.”

O d. 3.
○ d. 3. A Piece of a larger, little different. From the Sea-Shores betwixt Skegnés and Ingoldmills, Lincolnshire. Mr. Morton.
○ d. 4. Another Mafs of a coarfer Grain, whitish, with Spots of a light Brown, and small Spangles of the Silver Talc. Found near Oxenden in Northamptonshire. Mr. Morton.
○ d. 5. A small oval grey Mafs, very thick fet with like Spangles, but somewhat larger. Found on the Lincolnshire Shores with No 3.
○ d. 6. Another larger, otherwise a little different. From the same Shores.
○ d. 7. Another flat oval Stone, in which the Talky Matter consists of parts very small and fine, and is throughout incorporated with the grey Matter of the Stone. 'Tis thick set with small round ferruginous Bodies, standing out somewhat above the ordinary Surface of the Stone, being probably harder, and so having better sustain'd the Agitation of the Sea, which the Stone appears to have undergone. Still from the same Shores.
○ d. 7* Another like Body, found along with the precedent. 'Tis cut and polish'd, to shew the interior Constitution of it.
○ d. 7 †. A Piece of dark grey glossy Talc, with some white Spar interpos'd betwixt the Flakes of it. From - - - - - - in Yorkshire, where it is in great plenty. 'Tis called there the Warming-Stone, they laying it in their Beds at their Feet in cold Weather. When once heated, it retains it a great while.
○ d. 8. A flakey Mafs, grey, with a Cast of Green; in which the Talky Matter makes the greatest part of the Mafs: and is equally diffused and incorporated with the other Matter of it. This very much resembles what is sold in the Shops for Venetian Talc: and differs from the Lapis specularis, or Muscovy-Glass.
○ d. 9. A dusky brown Mafs, with little Spangles of the silver Talc in it. From the same Shores of Humber.
○ d. 10. A dusky brown Mafs, with little Spangles of the silver Talc in it. From the same Shores of Humber.
○ d. 11. A Piece of a Gritty-Stone, of a deep red Colour, having in it very many Flakes of a white Talc, larger than those of the precedent. Found in the Gravel-Pit, near the Bowling-Green on Hampstead-Heath.
(63)

Q. d. 11. A white sparret Mass, thick set with Grains of a black glossy Talk. Found upon the Shores near Oouthorn, in Yorkshire. This sparret Mass appears to have been beat out of a Vein of the Neighbouring Cliffs: and, tho' the talky Plates in it lie in something of a Method, yet not near so regularly as they do in the Strata. And they lie in much the same Manner in those Q. d. 25, 26, 31, 32, 33, 34, 35, 39, 40. Also in the Masses Q. d. 14, 15, 24, 29, 38, 44. which were all out of the Veins, or Perpendicular Fissures.

Q. d. 12. A Mass, grey, and having throughout a very plentiful admixture of a black glossy Talc. From the Sea-Shores of Lincolnhshire, between Skegnefs and Ingoldmells.

Q. d. 13. Another, less, otherwise not much different. From the Shores of Humber, near Hull.

Q. d. 14. A piece of Stone consisting partly of a Spar, white, with a Caft of red: and partly of a black glossy Talc. The Talc is very loose and brittle, the Flakes of it scaling off with the slightest force imaginable. 'Tis easily reducible into an extremely fine and impalpable Powder: And may fitly serve to keep any Metal that is cast, from sticking to the Mould. By reason of the Ponderousness of it, some have thought it contain'd metalick Matter in it; but, upon Tryal, that proves a mistake; nor is there any Metal in the same Pits where it is found; which are at . . . . . in Devonshire. There are several whole Strata of it lying from near the Day to a great Depth.

Q. d. 15. Another piece, consisting entirely of the same black Talc, without any interposition of Spar. Found with the former.

Q. d. 16. A whitish sparret Mass, having in it many Spangles of a shining Gold-colour'd Talc, and some of a Black. This may not unfitly be call'd Mica-Aurea. Vid. No. 2. From the Shores near Oouthorn in Yorkshire.

Q. d. 17. A Mass consisting chiefly of a yellow Talk, somewhat paler than the former. There are amongst it a few Grains of a whitish Spar: and on one side there adheres to it a pale brown hard Clay. From Lovingland, on the Coasts of Suffolk.

Q. d. 18. A piece of fine Sand- Stone, having a large Proportion of a pale yellow Talc, in very small Spangles, throughout all parts of it, sent me, for Silver-Ore, from . . . . . in the Countess of Kent's Estate in Bedfordshire.

Q. d. 19. A Mass of yellow shining Talc, with a yellow earthy Matter mix'd with it. From Pullock's-Hill, near Selfe, two Miles from Ampthill, Bedfordshire.

Q. d. 20. A gritty friable brown Stone, with small Spangles of a pale yellow Talc. From the Island of Jersey. Mr. Southwell.

Q. d. 21. A very hard Stone, of a ferruginous Colour, in which is a considerable Number of Spangles of Talc of a Gold Colour. Upon tryal it yields some Sulphur, and a very little Tin. 'Tis found in vast Quantities, at . . . . . in Cornwall.

Q. d. 22.
A piece of a grey Mafs, compos'd partly of a white Spar, and partly of black Talky Spangles, in near an equal Proportion. Found about 1/4 of a Mile South of Outhorn, Yorkshire.

A piece of a black glossy shining Talc, with some intermixture of a white diaphanous Sand. From Hackney Shores, Yorkshire.

A Talky Mafs, from Crick, Northamptonshire. 'Tis of a Sandy Colour. The Talky parts break in Flakes, not unlike the Lapis Judaicus.

A whitish sparry Mafs, with Spangles of a Black, and some few of Gold-colour'd Talc. This is little different from Θ. d. 16. only that the Spar has a reddish Cast, and the Golden Micas are fewer. Found near Paul, in Yorkshire.

A Mafs made up of black, white, and reddish Grains of a Talky Spar. Found near Outhorn, Yorkshire.

A Talky Mafs, grey, and flaky, with a very shining Silvery Gloss. There are in it small Knots, the biggest not exceeding the Size of a common Pea. Some of them of a deep red, others of a black Colour. From Scarborough, Yorkshire. It lofes not the Gloss in Calcination, but burns to a Substance more approaching a Gold Colour: and is so very like Litharge, as not to be distinguished by Refiners, who have made many Tuns of that Commodity. Sent me by Dr. Cay, who supposes it to be the Galaicos Argyrodantium Similis. Plin. Nat. Hist. L. 37. C. 10. From Newcastle upon Tyne.

A grey Silver Mica, very thick set with small shining Spangles. Weston Gravel-Pit, Northamptonshire. Mr. Morton.

Spar, white, and brown; with Plates of a fine white glossy Talc in it. Roach, Cornwall. It seems to have been taken out of a Vein.

Part of a coarse, brittle, sparry Mafs, full of Flakes of Talc, very fair, white, with an Eye of yellow. Buckland, near Royston, Hertfordshire.

Mica argentea. Hinxton, Cornwall.

Mica argentea. This is in Appearance very much like the Granite of Arabia. See the Catalogue of the Exotic Fossils. Found in the River Palmer, Cornwall, near the Sea; and worn to an exact Round or Globose Form, by the Motion of the Water.

Mica argentea, with a whitish Spar. Found in the same River.

Mica argentea, in a Stone of a blackish Ground, spotted with light brown. St. Cleer, Cornwall. This sort is also found on Rouse, in the same County.

A Stone, porous, grey, with a Cast of Green. There are Plates of a white glossy Talc in it. Found in the River Palmer, Cornwall.

A Stone, finely variegated with Spots of red and white; with extremely small Flakes of white Talc in it. Found on a great Hill near Castock. 'Tis also not uncommonly found...
In other Parts of Cornwall: and is called there, Wormseed-Stone, being thick set with small Bodies, not unlike the Semen Santonicum, or Wormseed. 'Tis somewhat related to the Porphyry-kind.

Q.d. 37. Brown Stone, with Spangles of the Mica argentea in it. From the top of Pendle-Hill, Lancashire.

Q.d. 38. A Mafs spoted with black and white, and having in it Micae of a grey Talc; very much resembling the Granite of Arabia. See the Catal. of the Exotic Fossils, Part 2. Number 38.—This was brought from Eden-Hall, in Cumberland, where 'tis found in vast Quantity.

Q.d. *38. A Mafs, white, spotted with black, having grey Micae in it. This is exactly like the Granite. 'Tis found in Fissures in the Skrees, Cumberland.

Q.d. †38. A Mafs little different; only the Ground has a Cast of red. There are Fragments of it, of considerable Bulk lying near the Skrees, Cumberland.

Q.d. 39. A gritty Stone, ponderous, of a dusky red Colour; with silver Micae in it, and small Bits of a white Crystallin Spar. This is not much different from the Porphyry. Hinxton, Cornwall.

Q.d. 40. A Mica, white, with a Cast of yellow. Loo-Beach, Cornwall.

Q.d. 41. Another, from—- in the Peak; where 'tis call'd Sulphur-Earth.

Q.d. 42. Mica aurea. Hinxton, Cornwall.

Q.d. 43. A grey Mica. Keswick, Cumberland.

Q.d. 44. A Mafs, red, and ponderous; with white Spar intermixed, and Flakes of a black glossy Talc. From the Mine at Northmoulton, Devonshire. This seems to hold Iron. The Workmen there give this the Name of Call.

Q.d. 45. A black glossy Mica. This is found in great Quantity at Minburniat, Cornwall. About fifty Years ago 'twas judged to hold Silver, and work'd for that Mettal.

CLASS IV. PART II.

Selenites Rhomboidalis.

EXTRACT.

Selenites, found lodg'd in Sand-Stone. b. 13:

--- found in Clay. a. 104, 105. d. 1, &c.

--- found particularly in the Clay near the Wells of purging Waters at Epsom, Dulwich, &c. and therefore hath been supposed to impart the cathartic Property to those Waters; but erroneously; the Selenites being so far from being cathartic, that it is astringent. d. 44. Append. d. 49.
Clay in Selenites. d. 17. 33. 34. 54.
Spar, incorporated with the Selenites. d 46.
Marcasite, incorporated with the Selenites. d. 46.
Pyrates, adhering to the Selenites. d.31.

C. I. Of the Rhomboidal Selenites of Steno Prodr. p. 79:

SECT. I. With the Rhombs single or separate.

The Rhomboid Selenites is cautiously to be distinguished from the Selenites of Dr. Scheuchzer, (Specimen Lithogr. Helvet. p. 29.) and the German Naturalists; which is only a Spar: externally of no certain or regular Figure, but breaking into Rhomboidal Masses.

Whereas this is ever externally of a Rhomboid Shape: and is properly a Nodule. 'Tis indeed one of the most remarkable of all the figur'd ones. When entire, 'tis constantly uniform: and has no marks of Adhesion to any Solid. Consequently this Body was form'd in Water; in which 'twas wholly free during its Concretion, and not contiguous to any solid Body whatever.

'Tis frequently met with very small, and indeed of all sizes, from the Weight of a Grain, to that of a Pound, or thereabouts; but is ever of a Rhomboidal Shape, tho with some diversity.

Now the Body being constantly of the same Figure, of whatever Magnitude it happens to be, 'tis evident that every Advance, in the Formation of it successively from the very Initia and first Stamina, is in a Rhomboidal Form; the Process here being much the same as in the Crystallizations of the common Salts, Vitriol, Alum, and the rest; that are ever observ'd to be of near the same Figure, at what size soever a stop is put to the Progress of their Concretion.

The same is further evident, by a blueish Clay in d. 19. which, intervening whilst the Body was in the Act of Formation, and only about 1/3 of the Matter, that finally composed the whole, was concreted, distinguished and showed the Figure of the Surface of the Body when of but about 1/4 of the Dimensions that the whole at length attain'd to. And the Surface of this interior Rhomboid is exactly of the same Figure with that of the exterior: and every part of that at equal distance from this. The blueish Clay above mentioned, appears plainly to be of like sort and Constitution with that of the Stratum wherein the Body lay. Indeed, in splitting and breaking the Selenite, found in several Places, I have commonly observed incorporated with them Particles of Clay no ways different from that of the Stratum, in which the Selenite were lodg'd, frequently very thick in great Numbers, and with such other Accidents, as clearly to indicate
indicate they were all form’d and finish’d before ever they were reposited there, or the Strata compiled. In truth the Sea-Shells, of several sorts, that are commonly found lodged together with them, point forth the Deluge for the time of their Formation; when, as well as all other terrestial Matter, that Clay was sustain’d in the Water, wherein these, and all other Nodules were form’d *; and so it could not well be avoided but that some of it must intervene in the Concretion of the Selenites, and be inclosed in the Body of it. Considering the Circumstances of their Formation; ‘tis rather a Wonder that so many of them are free, clear, and transparent, as we commonly find. In conclusion, the Selenite, Shells, and Clay, settling all down, compiled the Stratum.

The *Rhomboid Selenites*, is composed of parallel Plates, transparent, very thin, flexil, elastic: and that are easily split, and parted from each other. The Plates are compos’d of straight parallel Fibres. d. 1. 2.

The Plates of this Body were anciently employ’d for the Lights of Windows: and, when Glass came afterwards to be more commonly made, and generally to obtain, they cut it into Rhomboidal Panes, in Imitation of these Plates. d. 18. Appen.

Sect. II. The *composit* Rhomboid Selenites.

The Conjunction of several Rhombs happen’d by their being in the Water, so near together, whilst in the Act of Formation, that they interfer’d, intrench’d upon each other: and so, of meer necessity, combin’d into the same Lump. d. 20. & seqq.

C. 2. Of the Irregular Selenites.

This is of the same Nature and Constitution with the Rhomboid Selenites: from which it differs only in Figure. It is form’d in Fissures of Stone, where ‘twas confin’d, and had not Scope to crystallize and attain a Rhomboidal Figure. d. 50.

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CLASS IV. PART II.

Selenites Rhomboidalis.

*d. 1. The Selenites Rhomboides of Dr. Plot, (Nat. Hist. Oxfordshire,) found in the Place he mentions, viz. in Heddington-Quarry, in a vast Stratum of a dark blue Clay, that lies above the Strata of*
Stone. This Body in length, measuring in a Diagonal, from the
two extreme Angles, two Inches and \(\frac{1}{10}\); in breadth, measuring
from the two opposite Ridges of the longer Sides of the Rhomb,
'tis \(\frac{9}{10}\) of an Inch: in thickness, measuring from the two parallel
Rhomboidal Planes, 'tis \(\frac{7}{10}\) of an Inch. These Bodies are soft, and
easily split into Plates, parallel to the Rhomboidal Planes. This is
very clear and diaphanous: and its Surface very polite. The Ridge
that runs round the Sides of this Body is in all Parts equi-distant
from the two Rhomboidal Planes: and consequently the eight
Trapezia on its Sides are all of the same breadth.

d. 2. Another Selenites Rhomboidalis. This is nearly of the same
size with the foregoing, but much thicker, the two opposite
Rhomboidal Planes being \(\frac{9}{10}\) of an Inch distant from each other.
'tis not so diaphanous as the former; several dusky Clouds {hewing
themselves in the Body of it. Nor is its Surface so polite as the
Surface of that. 'Twas found in a Clay-Pit in a Lane in the
Midway betwixt Wotup and Standford, Northamptonshire. There are
multitudes of them found in this Clay. Mr. Morton. The Tra¬
pezia in this are not so near of the same breadth as in the former.
This consits of several Plates laid upon each other, all parallel to
the Surface of the Rhomboidal Planes: and the Plates are made up
of several Threads, laid all parallel to the shorter sides of the Rhom¬
boid. They are very conspicuous all over the two Rhomboidal
Planes, and the four shorter opposite Trapezia, i. e. those at the
Ends of the Body: but not on the Sides, or the four opposite longer
Trapezia. So that 'tis evident this Body consists entirely of Threads
running acrofs it, and all parallel to each other, and to the shorteft
sides of the Rhomboid.

d. 3. Another of the same Shape, but scarcely a quarter so big
as that N° 2. The Threads of this run the quite contrary way to
those of the other: being all parallel to the longer side of the
Rhomboid. From the same Clay-Pit.

d. 4. Another, of near the same Size with N° 2, but not near so
thick; the Threads running alfo the same way as in that. Only
one of the Rhomboidal Planes, for about the thickness of \(\frac{1}{10}\)
of an Inch: at one of the acuter Angles, the Threads fall short, and do
not reach home to the other side of the Body, by almost \(\frac{1}{10}\)
of an Inch; by which means there's left a Cavity of a Rhomboidal
Shape. From the same Clay-Pit.

d. 5. 6. 7. Three other Rhomboidal Selenites, having nothing pe¬
culiarly observable in them; only the Threads terminating abrupt¬
ly before they arrive at the opposite side of the Rhomboid, make
there a cavernous, abrupt, and irregular Surface. But from all 'tis
apparent that these are constituted, and the Threads of which
they consist, are disposed in the manner noted in N° 2. From
the same Clay-Pit.

d. 8. 9. Two others, in which some of the Threads are abrupt,
as in the four precedent: and some others are wholly wanting
at one end of these: So that instead of the Ridge that parts two
of the Trapezia in those, there appears a Furrow in these. From the same Clay-Pit.

d. 10. Another, having only this observable in it, that one of the Trapezia, on the longer side of the Rhomboid, is as broad again as the adjacent Trapezium. All the rest are nearly of the same breadth with each other, the Ridge parting them in the middle. From the same Clay-Pit.

d. 11. Another, of a more oblong and slender shape than any of the former. 'Tis one Inch and \( \frac{1}{3} \) in length from the two extreme Angles. One of the longer sides of one of the Rhomboidal Planes is \( \frac{2}{5} \) of an Inch in length, and \( \frac{3}{10} \) a-cros. The other opposite Rhomboidal Plane is something narrower, being but \( \frac{4}{5} \) of an Inch a-cros. Two of the lateral Trapezia are as broad; but the other two are not much above half that breadth. The Ridges in this rise but very little: So that the Body approaches pretty near a Parallelipiped. This was found in the great Clay-Pit near the Wells at Richmond in Surry. Upon the larger Rhomboidal Plane, appear four Lines, at near an equal distance from the Margins of the Plane, so as to describe a somewhat lesser, but like, Rhomboid upon it.

d. 12. Another, less than any of the former. The sides of the opposite Flats are near equal; being each about \( \frac{1}{3} \) an Inch: So that these Planes are, if not perfect Rhombs, yet approach very near that Figure. The Ridge on the Sides environs the sides of the Body in the middle: So that the Trapezia are all of equal breadth. Found in the Clay of Heddington-Quarry, Conf. N° 1.

d. 13. Another, little different from the foregoing, only somewhat less: and found too in the same Place.

d. 14. Another, much less, being but \( \frac{1}{3} \) of an Inch in length, measuring from the two extreme Angles. This is of an oblong Rhomboidal Shape, very like that N° 1. The Body is very diaphanous, and the whole Surface very smooth. The two opposite Rhomboidal Planes are of like Figure and Extent: and the Ridge environs the sides of the Body in the middle; so that 'tis a very exact, regular, and beautiful Stone. Heddington-Quarry. Vid. N° 1.

d. 15. Another, little different from the foregoing, only somewhat less. Found in the same Quarry.

d. 16. Twelve others, little different in Shape from the foregoing. Found in the Clay-Pit, betwixt Wooton and Standford, along with N° 2. Six of these are nearly of the Size with that d. 14. the rest are less; two or three of them are indeed not above \( \frac{1}{8} \) of that bigness.

d. 17. Another about the Bigness and Figure of that N° 14. Being held to the Light, there appears in the Parts next the four Sides of the Body, four dusky blackish Clouds, the intermediate Parts being pellucid, and in form of a Cross, the Extremities terminating with the four Angles of the Body. Found in the same Pit with the precedent.

d. 18. Another, a little bigger, from still the same Pit. This has on one of the Flats, four whitish Lines, describing a Rhom-
boid, all equi-distant from the Margins of the Rhomboidal Plane. The Lines seem to pass the Body diametrically quite to the opposite Flat or Surface, where a like Rhomb appears.

d. *18. One half of a very large Rhomboidal Selenites. 'Tis somewhat above five Inches long, or betwixt the two extreme Angles. In some Parts it is very clear and transparent: In others are thin Maculae, of a grey Colour, and indeed of the same Colour with the Clay in which 'twas found. This is not different from the other half, which would easily split thorough the whole Body of the Stone, into thin Plates. This Selenites is of that fort and shape which was used anciently for Windows, when split in that manner, and framed together with Lead. In imitation of which, when Glass came afterwards into use, that was commonly cut into the same Form. This was dug up in a Tyle Clay-Pit in Childrens-Field, in the Parish of Thurnham, three Miles from Maidstone, Kent. Dr. Hatley.

d. 19. A large Rhomboid Selenites, being two Inches and $\frac{1}{2}$ from the two extreme Angles. 'Tis in Figure oblong, and very like that N° 1. In the middle of it appears another, exactly of the same Shape with the exterior; and having all its sides equally distant from those of the ambient. This central Rhomboid is one Inch and $\frac{1}{2}$ in length, measuring in a diagonal to the two extreme Angles. Mr. Bland. Found in a Brick Clay-Pit, at Kettering, Northamptonshire. The Surface of the interior Rhomboid is distinguished by blue Clay that happened to apply there in the Progress of the Formation of the Body: and this, with what has been noted in the several precedent Bodies, shews plainly that the first Stamina are laid, and the whole Progress of the Formation, to the last made, in the same Rhomboidal Form.

d. 20. Another of near the same Shape, but less, being only two Inches in a diagonal from the two extreme Angles. Into the middle of one of the Trapeziums is infix'd a lesser Rhomboid is Selenites, passing into the Body of the larger. Near as much of it isimmers'd or included in the Mas of the larger as is extant: and that End that is within, the larger being very pellucid, appears to be of the same Rhomboidal Figure with that without. Heddington-Quarry, in the Stratum of Clay. Vide N° 1. The lesser of these Bodies must have been form'd before the larger: and with the space in which this was form'd; so that 'twas in the way of its Concretion: and there was not scope for it to complete its full Form. This affords us an Argument of the quiet State of the Fluid in which these Bodies were form'd.

d. 21. Another of the same Shape and Size, having three lesser infix'd into it. From the same Clay-Pit with N° 2.

d. 22. Another, with a lesser in like manner infix'd into it. This is split in a Section parallel to the Planes of the Rhomb. The exterior, in dividing, parts at the Surface of the infix'd lesser Rhomb. Whence 'tis evident that they are not continuous: and that
that the lesser included Body was formed before the larger. **Hed-dington-Quarry. Vide N° 1.**

d. 23. Another, of near the same Shape and Size with that N° 19. It has one pretty big, and three or four lesser Rhomboids, infix'd into the Trapeziums on each Side about the Middle of it. Found in the great Clay-Pit near Richmond-Wells.

d. 24. Another as large, from the same Pit. Each of the Trapeziums are as broad as the rhomboidal Planes: So that it is not so flat as the precedent generally are, its greatest Diameter being from one of the said Planes to the opposite; whereas the greatest Diameters of those are from the two opposite Ridges parting the lateral Trapeziums. There are ten or eleven lesser ones infix'd into the Middle of it.

d. 25. Another, not near so big, but of much the same compressed Shape: and having seven or eight lesser ones infix'd into the Middle of it. From the same Pit at Richmond.

d. 26. Another, from the same Pit: and of the same Shape and Bigness with N° 25*. having two lesser infix'd into it.

d. 27, 28. Two others, bigger, from the same Pit. They have a great many lesser ones infix'd in Clutters all round the Middle of them.

d. 29. Another Rhomboidal Selenites of a compressed Form, having many others of like compressed Form infix'd round the Middle of it. From the same Clay-Pit, near Richmond-Wells.

d. 30. Another, not so big, having a vast many little ones infix'd all round the Middle of it. From still the same Clay-Pit.

d. 31. A large flat Body, being 4 Inches in length, 3 in breadth, and 1\frac{1}{16} in thickness. It is made up of 6 Rhomboidal Selenites. In the middle are two pretty long Rhomboids, seeming to cross each other at equally oblique Angles. In the two opposite Sinus's of the Cross, are two Rhomboids of the same Thickness with the cross ones, but shorter, adhering to each other, and to the cross ones in the same Plane. All of them are much chop'd and incised by their having lain for some time expos'd on the top of the Clay to the Weather, and perhaps to the Erosion of the vitriolick Matter that is pretty plentifully mix'd amongst the Clay, in which this was originally lodg'd. There adheres to it, in a Sinus, a Nodule of the Vitriolick Pyrites of about the bigness of a large Pea. Clay-Pit, near Richmond-Wells. The Chops and Clefts shew the Manner of the Grain, and Constitution of these Bodies.

d. 32. Two other Rhomboidal Selenites, placed cross-wise like the former. In the two opposite Sinus's, are two Bodies of like Thickness and Substance with the Rhomboids, adhering to them so as together to make up an oblong flat Body. Found at Great Bowden in Leicestershire. Mr. Bland.

d. 33. An oblong flat Selenites, 4 Inches and \(\frac{3}{4}\) in length, 1 in breadth, and \(\frac{3}{8}\) an Inch in thickness. The two opposite Sides rise into Ridges, like those of the Rhomboidal Selenites. And on one side,
Side, towards the End, a Part stands forth about $\frac{1}{3}$ of an Inch, for about 1 Inch and $\frac{1}{3}$ in length, terminating with an acute Angle, and appearing exactly like a Side of a Rhomboidal Selenite, jetting forth further than the rest of the Body. Indeed the Body seems to be composed of two Rows of oblong Rhomboidal Selenite, each joining to other at the Ends, and each Row being joined to the other at their Sides. For the Threads, that constitute it, run all obliquely in a Parallel, as those of the Rhomboids do; and meeting in the middle of the Body in obtuse Angles, just as several Rhomboidal Selenite, placed in the manner intimated above, would do. Through the Middle of it, for near the whole Length, runs a blackish, dusky, plumous Body, much like that delineated by Dr. Plot, Oxfordsb. Tab. 2. Fig. 1. d. sending forth, on each side, small Fibres obliquely, and indeed parallel to the Threads of the Body; being probably no other than some fine Parts of the blue Clay, either incorporated with it at its Formation, or infinuated since into it, the Body being of a Constitution so lax, that Ink will sink and infinuate into it, as the said Clay dissolved in Water might. 'Twas found in a Bed of a dusky blue Clay, in digging the Canal near the Earl of Montague’s House at Boughton, in Northamptonshire. Mr. Morton.

d. 34. Another, little different from the preceding; only, as that has one, this has two Jets, over-against one another, on each side of the Body, forming acute Angles with it, and appearing as two Rhomboidal Selenite apply’d together in the manner intimated above. This has also a like plumous Body in the Middle, but finer, and somewhat less conspicuous than that of the former. Found in the Clay, over the Stone, in Heddington-Quarry, Vide N° 1.

35, 36. Another, somewhat broader, and split in two, to shew the interior Texture of it. One End of it terminates in an Angle exactly like that of the Rhomboidal Selenites. The Threads of it are placed obliquely and parallel: those of one Side meeting at a Line in the Middle of the Body at obtuse Angles, as in N° 35. Heddington-Quarry, near Oxford. It parts into Plates, as the Rhomboid Selenite do: and is ridged on the Sides, as they are.

37, 38, 39. Three others, broken, so as more plainly to exhibit the interior Texture and Composition of this sort of Selenites, which is suggested in N° 33. and the two following.

40. Another oblong Selenites, much less than any of the foregoing. 'Tis flat, 1 Inch and $\frac{1}{3}$ long, and $\frac{1}{3}$ of an Inch broad. 'Tis ridged on each side, as the precedent are. Heddington-Quarry.

41. Another, of much the same Shape and Size with N° 40. From the Clay-Pit in which N° 2. was found.

42. Another, from the same Pit, and of the same Shape, but a little less.

43. Four like small oblong Selenite, all fix’d into the End of one somewhat larger. Heddington-Quarry.
d. 44. A flat thin Body, somewhat concave, being composed of many Selenites, all small, but of different Sizes. As to their Shapes, they are all angular, and tending towards Rhomboids. They are placed in no Method or Order: being cemented promiscuously together, by a very small Quantity of a light-brown earthy Matter. This was part of a Ball, about the Bignefs of a Man’s Head. ’Twas hollow within, and lined with this Crust of Selenites. Without ’twas cover’d with a thin Crust of a pretty hard Subfance, and a dusky grey Colour. ’Twas lodged in a Stratum of Clay of the fame Colour, at the depth of about 16 Foot, and about 2 Foot above a Stratum of Stone. ’Twas found in sinking a Well at Bowden, in Leicestershire. Mr. Bland. There was nothing in the hollow of it, except a small Quantity of a loose Dust or Powder. They found only this Ball and another, which was of an oblong Form, and not fo big as this was. N° 45. is a Piece of it.

d. 44. A like flat Body, thicker than the precedent, composed of Rhomboidal Selenites, of several Sizes, very clear and fine. This was found in sinking the Purging-Well at New-Crofts, near Deptford.

d. 45. Another flat Piece of like Sort; on the Outside of it is a grey Crust of a pretty hard Subfance, about \( \frac{1}{12} \) of an Inch in thickness. Upon this are irregularly set many small Selenites; all of them, or for the most part, standing endwise. They are generally of the same Size, and of a compress’d rhomboid Shape, not unlike those of N° 29. supra, but much less. Confer. N° 44. supra.

d. 45. Several like Selenites, separated: not fo transparent as those of the precedent. Found, many Years ago, at the first sinking of the Purging-Well at Acton.

d. 46. A pretty large Piece of a Selenites, seeming, by the Cast and Grain of it, to have a Sparry Matter mix’d with it. There are incorporated with it severall Grains of a very bright yellow glittering Marcasite; the largest of them scarcely fo big as a small Pea. Found in sinking a Well near Nottingham.

d. 47. A flat Body, half a Foot in length, and 3 Inches broad, composed of several pretty large Rhomboidal Selenites, placed in one Plane in a double Row, except some few at one End of it, whose Position is irregular, one or two of them being prominent, and seeming to be infix’d tranfversely into the Body. Found in the great Clay-Pit near Richmond-Wells.

d. 48. Another, from the fame Place, much like the former, only somewhat less: and there are several Rhomboidal Selenites infix’d round the Middle of it; where it, being broken, discovers they all tend to the fame Point in the Axis of the Body.

d. 49. A Mafs, consisting of several small Rhomboidal Selenites, placed irregularly and confusedly one by another. Found in digging the Well of Purging-Waters at New-Crofts, near Deptford, Kent.
Kent. The Selenites being discover'd near this Well, the Purging-Springs by Shooter's-Hill, and those of Streatham, Dulwich, Epsom, Richmond, Kensington, and Acton, has induced some unskilful Persons to believe, that these impart the Purging Power to those Waters. But the Selenites is found in those parts, as commonly where there are no such Waters: and indeed in equal plenty where-ever there is digging for common Wells, Brick or Tile-Clay, or other Occasions. This Body, by Calcination or otherwife, being to be reduced to a very fine and impalpable Powder, is fitted for being taken either inwardly or outwardly. But all our Tryals inform us, that its Properties are the same with common Talc, it being a pretty strong Exsiccant and Absorbent: and is very powerfully binding, instead of purging. More accurate Enquiries and Observations have taught us, that the purging Qualities of those Waters are owing to the vitriolic and other Salts; lying, along with numerous Pyrites, in the Strata through which those Waters drain and pass.

_d._ 50. A flat Body, near half an Inch thick, composed of small thin Plates, placed all edgeways, but irregularly, and terminating in the same Plane on the two opposite Surfaces. Found about 150 Foot deep, in a Fissure of Paving-Stone in the Isle of Portland. They are found both in the horizontal and perpendicular Fissures of the Stone. This appears to have fill'd the Fissure, and been contiguous to the Surface of the Stone in both sides. It seems to be of the same Constitution and Matter with the Selenites.

_d._ 51. Another flat Piece of the same sort, but thinner; several of the small Plates in this are placed not directly edgeways, but more obliquely than in the former. From the same Quarry.

_d._ 52. A Mafs, made up of many very small Selenites, cemented together by a brown earthy Matter. They are angular; but of what particular Figure, is not easy to determine, because of their being impacled so thick and confusedly together. Out of a Lead-Mine, at Workefsworth in the Peak. It lay near the Surface: and seems to have been left by the Water of the Deluge departing; by means of which it appears to have been tumbled thither from afar, worn, and smooth'd.

_d._ 53. A Piece of Flaky, Fissil, Selenites, in some Parts of a white, in others of a yellow brown Colour. Digged up near Epsom-Wells, Surrey.

_d._ 54. A Rhomboidal Selenites, with Clouds and Specks of blue Clay in the Body of it. From — — — — in the Peak.

_d._ 55. A Selenites, 2 Inches and an half in Length, and $\frac{3}{4}$ of an Inch in Diameter; having fix Sides near equal, and terminating at each End in a trigonal Point. There are several lesser ones infix'd into it about the Middle of the Column: in much the same manner as in _d._ 24, 27, &c. This was found on the Top of the Moulds, an high Hill in Arkendale, Yorkshire.
CLASS IV. PART III.

Talky Bodies that are Fissil and easily disposed to split; being composed of Fibres, generally straight, and lying parallel to each other.

EXTRACT.

Gypsum, + d. 11.
English Talc, +d. 1. & seqq.
Asbestos or Amianthus +d. 8, 9, 10, &c.

--- Consists of transverse Fibres of a Talky Spar, in Veins like the Scepta of the Ludus Helleniti.
Linum Asbestinum. + d. 10*.

Asbestos with Marcafit affix'd. +d. 9.
Asbestos in the Fissures of Marble. + d. 10.
--- in the Load-Stone. +d. 15.

English Talc, found in the Perpendicular Fissures of Stone, + d. 1. 2.
A Talky Body resembling Wood petrified, having in it several Veins, which seem to have been Cracks fill'd with Spar. Vid. +d. 40.
When broken, it emits a Sulphurous Smell. Found in a vast Stratum of Stone. +d. 5. 6.

A Talky Body found lodg'd in a Stratum of Gravel. +d. * 7.

English Talc employed for the making Wicks for Lamps: and will burn very long without any sensible Consumption. + d. 1.

Of the Mechanical Uses of Gypsum.

Talky Fibrous Bodies.

+d. 1. A Piece of a flat Body, very white, and shining, with some degree of Diaphanity. 'Tis somewhat above two Inches thick: and is made up of several very fine Threads, laid exactly parallel to each other, and very closely united together. The two opposite flat Surfaces are somewhat rough: having a small Quantity of a reddish gritty Matter adhering to each. The Body seems to have been lodged in one of the Perpendicular Fissures of a Stratum of Stone to have fill'd it: and the Threads to have run horizontally across from side to side. This is commonly sold in our Druggists Shops, by the Name of English Talc. Little-Leak, Leicestershire. This Specimen is only part of one that was much larger
larger, flat, and having all the Threads laid a-crofs; so that their Ends terminate in the two opposite flat Surfaces. Twas of the fame thickness in all Parts of it. It splits, in a Section parallel to the Threads, very eafily. A Small Piece of it, a little bruised, so that the Threads part and open a little, serves very well for a Wiek to a Lamp, and gives a good Light. Suck a Wiek will laft a great while. I kept one burning twelve Hours; when, extinguihing the Flame, I found the Wiek had suffer’d no sensible Conufion: nor was it any ways alter’d, only the Colour was changed to a pale brown. Mr. Hunt fays, great Quantities of this Body are found in Beds of Marl, about Highley, betwixt Warrington and Knapton, in Cheshire, in flat Lumps, lying horizontally. Thofe are usually somewhat thinner than this.

†d. 2. Another like flat Body, but somewhat more pellucid. Twis near an Inch and $\frac{1}{2}$ in Thickness: and the Threads grofter than tho’fe of the former. They run in like manner a-crofs from the one flat Surface to the other; but are intercepted by four Plates or Partitions, placed at near an equal Distance, and all parallel to the Surfaces of the Body. To one of the Surfaces adheres a pale-brown Stoney Matter: and that of the Partitions is of the fame Sort and Colour. This alfo seems to have been contained in a perpendicular Fiffure; near Newbury, in Berkshire. Major Heron.

†d. 3. Another, compofed of like parallel Semi-pellucid Threads with a Caft of Green. Found very plentifully — — — — — — in Bedfordshire. Dr. Allen.

†d. 4. Another, consisting of like fireght and parallel Threads, coarser than tho’fe of No. 1. opaque, and of an Ash-Colour. Found plentifully on Knife’s-Scarr, near Louth in Westmorland.

†d. 5. Another, opaque likewise, and of much the fame Colour with the foregoing. This is very large, being about seven Inches from flat to flat. Twis round, about five Inches $\frac{1}{2}$ in Diameter, and somewhat resembles a Piece of the Trunk of a Tree. The Workmen in thofe Quarries find this fорт pretty frequently: and take it for petrify’d Wood. But that is an Error, as may be evinced from the difpofition of the Threads of it. For, tho’ they lie, in moft parts of it parallel, yet there are fome that do not: but decline, into an oblique position, fo as to make acute Angles with the adjacent Filaments. This is of a Stoney Subfance, a fine clofe Grain, prettily hard, and when broken emits a sulphurous Smell. There run thorough the Body of it feveral Veins of a Semi-pellucid Spar, that feem to have been originally Cracks* in the Body till fill’d up with that sparry Matter. Found lodged in a vast Stratum of Stone in the Quarry in Portland, at a considerable Depth.

†d. 6. Another, little different, only lefs, from the fame Quarry. The Colour, Solidity, Texture, Sparry Veins, like tho’fe of the
foregoing; tho' it has somewhat a nearer likeness to Wood, and in one Part of it, is a resemblance of such a Knot, as is usual in Timber.

*d. 7. A Piece of another, from the same Quarry. This has some degree of Diaphaneity. The Fibres of it are near straight, and parallel.

*d. *7. A flat Piece of another, half an Inch thick. From a Gravel-Pit, near Ashley, Northamptonshire. Mr. Sawyer.

d. 8. A Piece of a flat Body, something above \( \frac{3}{2} \) an Inch thick. There run a-crofs it many flexil parallel Threads, of a white Colour, with an Eye of Green. 'Tis a sort of Asbesbus or Amianthus. From the Island of Anglesey. Mr. Lhuyd. Vid. Philos. Trans. N° 166. p. 823.

*d. 9. Another like Body, from the same Place. The Fibres or Threads of this have a somewhat stronger Cast of Green; and are intercepted in their Passage cross the Body, by three thin Plates set at near equal distance, and parallel to the Flats or two opposite Surfaces of the Body. On one of those Surfaces is affix'd a small Piece of a Marcalite.

*d. 10. A thin Vein of Asbeslos; in Marble, as it seems, of a blackish Colour with a Cast of Green. In some Parts of it is a Body very like Spar, of a greenish Colour, with an Eye of Yellow. From still the same Place.

*d. 10. Three Pieces of Asbeslos, with a Quantity of the Threads or Linum Asbestinum. Also from Anglesey.

*d. 10. Marble, of a blackish grey Colour; with Spots, Sparry, whitish with a Cast of green. 'Twas part of a very large Mafs, of like Colour and Constitution; and broke off from a Stratum. The Mafs was thick set with Veins of Spar, having a Talky Gloss, white with a Cast of green in some parts, in others with a Cast of yellow. The largest Veins were in Diameter about \( \frac{3}{4} \) of an Inch: the rest, thinner, of various Diameters; some so small, as to be just discernible. Those Veins are in Constitution exactly like the Septa of the Ludus Helmontij; and consist of various thin Plates, as those do. They are likewise striated a-crofs; and composed of transverse Fibres or Filaments. Some of these Fibres are inconceivably fine and flexible; and are what is commonly call'd Linum Asbestinum. Some few parts of the Veins consist of Spar that is not striated a-crofs. Those Veins appear manifestly to have been originally no other than Cracks, that were fill'd successevly by Spar, drain'd, by Water, out of the Bodies of the Strata; which abound with Spar of like Composition. From Anglesey.

*d. 10. Another Piece off the same Body, shewing the Veins and Plates very distinctly.

*d 10 +. Another Piece off still the same Body, with part of a Vein not striated a-crofs. The Spar, as usual, is whitish, with a Cast of green.

*d. 11. A flat Body much like *d. 1. only the Threads are not so fine. This is a sort of Gypsum. From ----- Derbyshire.
Another. This is extremely white, glossy, and shining. Found in the Alabaster Pit, at Chellaston, Derbyshire.

A Mass in which the Gypsum is mixed confusedly with a reddish earthy Matter. In some parts of it are Veins of the Gypsum more pure, and composed of Threads like the foregoing. From the same place, with 4.d.11.

Another, consisting chiefly of the red earthy Matter, but with some small Veins of the white thready Gypsum running thorough it, with some Selenite lodged in it. From still the same place.

A pretty large Piece of a Body of a very dark grey Colour, consisting of parallel Fibres running pretty straight the whole length of it. It was sent me by the Name of petrified Wood; and indeed it much resembles the Grain of Wood. 'Twas found on the Shores near Lulworth, nine Miles East of Weymouth.

A Mineral of a grey Colour with an Eye of green, only on one side it is of a pale brown. 'Tis composed of several Sheafs of grey Filaments, those of each Sheaf being generally parallel to each other, but the several Sheafs are variously laid, so that some of them lie cross one another. The Filaments appear like those of the Lapis Asbeios. 'Twas broke off from a piece of Loadstone of a dark ferruginous Colour, some Fragments of which still adhere unto it. From ---- Devonshire. Mr. Stonestreet.

A Body, white, glossy, and made up of Threads running cross-wise of it. 'Tis little different from that 4.d.11. only that is flat, and smooth, on the two opposite Surfaces, as if it had fill'd a Fissure in Stone, and been contiguous to both sides of it. Whereas this is unequal, and jetting out into Crystallizations on one side; tho' plain, and seeming to have been contiguous, and adhered to the Stone on the other. Arlebury-Quarry, Northampton. Mr. Morton.

CLASS IV. PART IV.
The Waxen-Vein, or Ludus Helmontij. Vide Preface infra.

EXTRACT.

Introduction. Of the various Names given to this Body by Authors. Vide Preface infra.

An Historical Account of the several particular Bodies in this Class; as also Observations upon each; with various Deductions from them. Vide Preface infra.

These recollected, and digested into a Method; in order to the setting forth the Natural History of this Body.
C. i. The Places where this Body occurs. On the Sea Shores, \&c. \&c. x d. 1. \& seq. x d. 9, 11, 17, 18, 19.

In the Cliffs. x d. 1.

In Plains, at distance from Sea. x d. 28. \& seq.

On high Hills. x d. 25, 30, 35, 40.

C. ii. The several Parts of England where 'tis found. In the Isle of Grains. x d. 19. In the Isle of Sheppy. x d. 1. \&c. In the Isle of Thanet. x d. 17, 18. Sherburn, Gloucestershire. x d. 7.


Peckham, Surrey. x d. 28. Norwood in Surrey. x d. 29. Near Lamb's-Conduit. x d. 34. Epping-Forest. x d. 37. Mary-lebon in Middlesex. x d. 38. Kilburn, Middlesex. x d. 39. Holloway, near Highgate. x d. 38. Highgate. x d. 35. 40, 43. \& seq. North of Grays-Inn. x d. 41. Pancras. x d. 42. In the Fields all along the North Side of London. x d. 52. LowEastoft in Suffolk. x d. 53. In London. x d. 55.

C. iii. In what sort of terrestrial Matter 'tis lodg'd. In the Strata of Earth, that constitute the Cliffs by the Sea, x d. \& seq.

In Strata of Clay, x d. 26. \& seq.

C. iv. At what Depths in the Earth it has been observ'd, x d. 43.

C. v. Of the Number and Frequency of the Ludus Helmontij, x d. 30.

C. vi. Its Posture in the Earth, flat-ways, and parallel to the Site of the Stratum in which 'twas reposited, x d. 1. \& 43.

C. vii. Of the various Magnitudes of the Ludus Helmontij, x d. 25. 28, 30, 43, 51, 52.

C. viii. Of the exterior Form of this Body.

§. 1. Tis a Nodule, and found ever loose and independent, x d. 25. \& alibi passim.

§. 2. Of a broad, flat, or compressed Shape, and commonly approaching round. x d. 1. 28, 38, 43, 52, 53.

§. 3. Generally somewhat lessening, or growing thinner towards the Margin, all round. x d. 52. \& seq.

Appendix. 1. Tis sometimes found naked and uncover'd, vide x d. 1.

2. But is most commonly surrounded and invested with a honey Crust. x d. 25, 26, 28, 30, 41, \& seq. 51, 52.

3. Some Instances there are of this Body composed of various Crusts, including one another, like those of the Bezoar Minerale. x d. 42. vide 40, 20.

C. ix. Of the interior Frame and Composition of the Ludus Hel¬ montij.

§. 1.
§. 1. It consists chiefly of a lapideous Matter. \( x d. 1. \& seq. \)
   \( Conf. \ c. 11. \ infra. \)
§. 2. That Matter is intercepted and divided into Tali. \( x d. 1. \& seq. \)
§. 3. This is done sometimes by Cracks and Fissures variously passing the Body. \( x d. 34. 38. 51. \)
§. 4. But generally by means of certain talky Septa or Partitions. \( x d. 1. \& seq. \)

C. x. Of the Figure of the Tali.
They are in shape of a Column, with 3, or 4, but most commonly 5 Sides. \( x d. 1.3.17. \)

C. xi. Of the Magnitude of the Tali. \( x d. 1.17. \)

C. xii. Of the Texture and Constitution of the Tali, or the main and common constituent Matter of this Body. \( Conf. \ c. ix. \)

§ 1. supra.
§ 1. The Tali are composed sometimes of a ferruginous or ochreous Matter, \( x d. 17. 18. 19. 28. \)
§ 2. But most commonly of a close stoney Matter, of a grey Colour, \( x d. 7. 22. 41. 52. 53. \)
  — of a foliomort Colour, \( x d. 1. \& seq. \)
  — of a Rusty Colour, \( x d. 42. \)
  — of an Iron Colour, \( x d. 35. \)
  — of a light Brown, \( x d. 1. 6. 12. 17. 20. 28. \)
  — of a dark Brown, \( x d. 5. 10. 13. 25. 52. \)
  — dark Brown, with a Blush of Purple, \( x d. 29. \)
  — Brown outwardly, and grey within, \( x d. 30. \)
  — variegated with Brown and Grey. \( x d. 11. 13. 51. \)

Append. 1. Several Particulars in the Constitution of Tali discovered by the Assistance of Microscopes. \( Vide \ Preface \ infra. \)

2. Of the Specific Gravity of the Tali, of the several sorts of this Body. \( V. ibid. \)

3. Chymical Experiments and Tryals with several Menstrua, in order to discover the Nature of all the different Kinds of this Body. \( V. ibid. \)

4. Tryals of the several sorts of this Body by Fire. \( V. ibid. \)

5. Of the medicinal Powers and Properties of this Body. \( V. ibid. \)

C. xiii. Of other extraneous Bodies, or Matter, intermixed or incorporated with the common constituent Matter of the Tali.

§ 1. Yellow Ochre. \( x d. 28. \)
§ 2. Crystal. \( x d. 4. \)
§ 3. Talc. \( x d. 5. \)
§ 4. Salts. \( x d. 25. 30. \)
§ 5. Marcasite. \( x d. 11. \& seq. \)
§ 6. Iron. \( x d. 25. 29. 0. 105. \)
§ 7. Pipe-Waxen Vein. \( x d. 11. \)
§ 8. Various Sea-Shells. \( x d. 105. 25. 27. 30. 40. \)

C. xiv.
C. xiv. Of the exterior Crust with which this Body is frequently found inveted. x d. 52. Conf. C. viii. Append. 2.

C. xv. Of the Septa, or Partitions, that parcel out this Body into various Mafles or Tali. x d. 1. & seq.

§ 1. They are composed sometimes of an ochreous Matter. x d. 17. 18.

§ 2. But most commonly of a talky Spar. x d. 10. 16. 20. 23. 40. 53.

§ 3. The various Thickness of the Septa. x d. 1.

§ 4. In those Bodies that are inveted with a Crust, the Septa lessen and grow thinner as they approach the Crust, terminate there, and rarely pass thorough it. x d. 5. 28. 32. 37. & seq. 51. 52.

§ 5. The Septa are compos'd of thin Plates standing edgeways, and generally parallel, and consisting of transverie Fibres, so that the whole appears to be striated crofs-ways. x d. 1. 22. 25. 28. 30. 35. 36. 43. 45. 46. 51.

§ 6. The Plates, tho' generally contiguous, are sometimes divaricated, and stand at some Distance from one another, so as to leave room in the Intervals for Spar to shoot, which it does into feall Cryftals. x d. 13. 24. 36. 37. 55.

Append. t. Thofe Cryftals are sometimes finely colour'd. x d. 33. 34. 36.

2. Stellar Effiorefcencies form'd also in the faid Intervals. x d. 16. Of the starred Waxen-Vein. ibid.

3. Effiorefcencies and Cryftallizations of Marcasit, upon the sparry Plates, form'd in thoie Intervals. x d. 12. & seq.

4. A Plate of Marcasit, interpos'd betwixt the sparly Plates, in one of those Intervals. x d. 11.

C. xvi. Inftances of some few sparly Partitions that intercept and pass thorough others. x d. 47.

C. xvii. The Cracks and Partitions divide and pass the Sea-Shells, lodg'd in it, as well as the Stone itself. x d. 25. 28. 40.

C. xviii. Dendrite, or fuliginous mineral Delineations of Shrubs, in the Ludus Helmontij. x d. 28. 40.


Artic 1. Reflections.

§ 1. Upon the Bignefs of this Body. Conf. C. vii. supra.

§ 2. Upon its being in Form of a Nodule, loose and independent. Conf. C. viii. supra.

§ 3. Upon its lying flat-ways, and parallel to the Site of the Strata, in the very Manner that all Bodies of like Form settling down from a Fluid are wont to lie. x d. 43. Conf. C. vi. supra.

§ 4. Upon the various Shells and marine Bodies included in it, and incorporated with the Mafs of it. Conf. C. xiii. § 8. supra.
§ 5. Upon the Cracks in this Body. Conf. C. ix. § 3. supra.
§ 7. Upon their growing gradually less, as they approach the Crust. x d. 40. Conf. C. xv. § 3.
§ 9. Upon the Partitions passing the Bodies of the Sea-Shells dividing and parting of them. x d. 40. Conf. C. xvii. supra.
§ 10. Upon those Partitions that divide and intercept others. x d. 47. & seq.

Artic. II. Deductions. Conf. Natural Hist. of the Earth. Part IV. Conf. 2. 3.

1. The main and common Mafs of this Body concreted, and was form'd in Water. x d. 43.
2. In which it was sustaine'd, along with Sea-Shells, and other like Bodies. x d. 43.
3. This was at the Time of the universal Deluge. x d. 43.
4. Upon the Retreat of the Water, it settled down along with the Clay, Earth, and other like Matter that form'd the Strata in which it was lodg'd. x d. 43.
5. It was, at its first Settlement, uniform and solid. x d. 40.
6. The Cracks in it were form'd afterwards. x d. 40. 47. Conf. 4 d. 5.
7. The Cracks and Breaches of the same Body, were made chiefly at the same time. x d. 47.
8. But some few Instances there are of Cracks made after that Time. x d. 47.
9. As the Water in which the Ludus Helmontij was form'd at the Deluge, Conf. C. xix. Art. 11. 1. 2. 3. supra. where-with the Pores and Interstices of the Body were saturate, during the Coalition of the Matter that compos'd it, gradually quitted it, and got forth, the said Matter was contracted, and shrunk up in divers Directions, and with a Tendency towards divers Axes in the Body; by which means the Cracks were affected, and the Mafs parted into Segments or Tali. x d. 25. 40.
10. The Cracks both of the Stone and Shells, were, generally, in tract of Time, gradually filled by Spar; the Water which is continually pervading the Strata deriving thence loose Particles of that Mineral, introducing them into the Cracks, and affixing of them there, so as thereby to form the Plates and Partitions. x d. 40. 45.
11. The sparly Partitions that are continued thorough, and intercept other sparly Partitions, are of a second Order, and were form'd since those others were. x d. 47.
The Waxen Vein: or Ludus Helmontij.

PREFACE.

The Body I am here about to exhibit is commonly called in England the Waxen-Vein. That Name, like many others, is not so apposite that one may imagine that they who gave it, made use of much Thought or Reflection. The Spar of some of the Veins, or Septa, particularly in those of Sheppy Island, is of a yellowish Colour, and somewhat resembles melted Wax; which perhaps was the only Reason they had to give it that Name. Indeed Dr. Grew (Muf. Reg. Soc. p. 311) seems to imply as much. He supposes the Waxen-Vein to be the same with the Ludus of Paracelius and Van Helmont. Dr. Plot (Nat. Hist. Staffordshire, c. 5. § 23.) is of another Opinion: and takes that Ludus to be a tessellated Pyrites. Of which sort he notes, out of Wormius, there are, at Oiferdale, in Norway. Wormius reckons this among the Copper-Ores: (Museum. p. 121.) and 'tis certain some of these Pyrites hold some small Portion of Copper, as others do of Iron. That Author, (ib. Mus. Worm. p. 39.) speaking of a like tessellated Body, found upon the Banks of the River Scald, near Antwerp, judges it the same with the Ludus Helmontij & Paracelii. He calls this Body Silex: and Dr. Grew pronounces him mistaken in reckoning it among Flints. (Muf. Reg. Soc. p. 312.) But in truth the Doctor himself is mistaken in thinking the Danish, German, and other Writers of Fossils restrain the Name Silex, to what we call here in England, Flint; they applying that Name to very various Bodies: and Wormius particularly refers the Pyrites to the Silex-kind, because it strikes Fire. He adds, (Mus. Worm. p. 39.) that Fr. Merc. Van Helmont, the Son of the famous Chymist, J.B. Van Helmont, produced a Stone, as the Ludus of his Father, that was very different from the tessellated Pyrites. His description of it is obscure: but it seems to have been of the same sort with that exhibited in this Class. I my self have a Stone (See the Catalogue of the Foreign Fossils, Vol. 1. No 1.) that was brought over, from Antwerp, into England, by Fr. Merc. Van Helmont, as his Father's Ludus, that is truly of this kind; but both the Tali, and Septa, are of a more dusky, or, as Wormius expresseth it, of a more fuliginous Colour, than ours in England commonly are: Wormius suspects this Testimony of the Son. For my own Part, I shall not enter into the Controversy, but content my self to give J. B. Van Helmont's Sense in his own Words.— Neque enim Ludus Paraclesi parat Lixivium: sed salem ex acido amarum. (De Lithiasi. c. iii. § 28. p. 672.) Quapropter fuium Ludum, Fel terrae vocat. Eft enim Lapis Siliceus, tenerior tamen, & qui fere totus per diurnurn bidui ignem avolat; cum fale petrae vero, multo celcirus. (ib. c. vii. § 22.)
§. 22. p. 699.) And again,—Ludus semper tali, tesserae aut cubi forma eruitur. Paracelius represents this Body as capable of dissolving the Stone in the Kidneys and Bladder: and Van Helmont proceeds here to give that Chymist's Method of preparing of it. Afterwards he expressly distinguishes this from the Pyrites: and indeed seems manifestly to design a Body of the very sort with that set forth in this Class, having the Tali of a pale or grey Colour, and the Crurts or Septa, in the Committures betwixt the Tali, Sparry, and in some measure pellucid. This he found also in a Stratum of Brick-Clay: as we commonly do ours in England. (x ib.p. 700.) His Words are,—Reperi autem illud ad ripam Scaldis prope Antwerpiam, ubi lateres coquuntur: Situsque est plus minusve 40 pedes subter horizontem,—in agro vicino,—per aliquot milliaria. —Est & praedicto agro Pyrites frequens, sulphure dives atque vitriolo. Quis etiam sub terrae praedurus fit, mox tamen sub aura fit frabilis, fatificente siclicet semen vitriolo. Sed Ludus, lapis est pallecens, subinde Crufta perspicua per Committuras obdubtus, magna sui parte, in clibano figurino volatilis. Hic nempe est Lapis, Saxifragorum apex, & Calculorum desiderium.

That Stone which B. Ambrofinus calls Marmor figuris Mathematicis naturaliter exaratum, Aldrovand. Muf. Metall. p. 768. appears, by his Icon, to be of the sort set forth in this Class.

P. S. Since that above was wrote, Sir I. Newton gave me a Piece of this kind of Body brought over from Germany by the younger Helmont, as the true Ludus of his Father; which does not differ, either as to the Constitution of the Body of the Stone, or the Septa, from those commonly found in England. The Tali are also of a grey Colour: as ours here commonly are. See the 1st Vol. of the Catalogue of the Foreign Fossils. So that there can be no doubt but the Body exhibited in this Class is the very same that J. B. Van Helmont design'd by the Name of Ludus. But then he was greatly mislaken in supposing this to be the Ludus Paracelusi. The Chymists, and Mineralists of Germany, who are very curious in these Things, and very exact in their Notices and Traditions concerning them, all agree that the Ludus Paracelusi is the tessellated Pyrites. And Sir Isaac Newton had this very Body sent from Saxony as Paracelusi's Ludus; of which he gave me a Specimen, which I have exhibited, amongst several others, in the 1st Vol. of the Catalogue of Foreign Fossils. No. 2. But yet Van Helmont, imagining it to be the same, positively ascribes to this the very Powers and Virtues that Paracelusi does to his: and particularly that very extraordinary Power of dissolving the Stone in Humane Bodies. Which is but one of many instances of the Fondness and Credulity of the Gentlemen of that Study. 'Twas not a very wild Name, Ludus, to be given, to a Dye, or Talus lusorius; considering how humourous a Writer Paracelusi was.

I have rarely observed the Ludus Helmontii lodged shallower than within four Foot of the Surface, or deeper than about fifty. 'Tis pro-
probable it may be found to a greater Depth; but I, having observ'd it only in Pits wrought for Tile and Brick-Clay; and in the Cliffs on the Sea-shores, but never in Mines, nor where there is sinking to a more considerable Depth; have had no Opportunity of making Observations deeper (§). See also the Register of the Chymical Experiments and Tryals, with severall Menitrura: as also the Tryals in the Fire.

The Waxen-Vein, or Ludus Helmontij.

x d i. A Stone, consisting of 28 Tali, distinguished each from other, by means of certain Septa or Partitions. The Tali are oblong: and some of them have four, but the greater Part five sides, which are very rarely equal. They are of different Sizes; some of them being as big again as others. The largest are about two Inches in Diameter. The Body that they, together with the Septa, compose, is near flat; being about the thickness of two Inches; which consequently is the length of the Tali, they standing transverse, and passing directly a-crofs the Body. Tho' the sides of the Tali be unequal, yet they are so fitted and placed by each other, as not ordinarily to leave any void Space. They are all made up of a very compact sort of Stone, of a fine Grain, and a light brown Colour. The Partitions pass quite thorough the Body of the Stone; the Edges of them appearing on each of the opposite flats; where they form a sort of Net-Work. This makes a very beautiful Variegation of the Stone; the Septa being of a yellowish Colour, and the Tali brown. Indeed each Talus is environ'd with a Crust or Case; which, conforming it self to the Sides or Planes of the Talus, is of a Figure quinquangular, or quadrangular, answerable to that of the Talus which it happens to cover. The Cases, where they join and are contiguous to one another, form the Septa or Partitions. These consequently are double every where in the middle of the Stone, and on the insides of the Tali: but on the outside of those that stand outmost and compose the Rim or Margin of the Stone, they are single, and in Form of a Crust; which is of a pale yellow Colour. These Cases are composed of several parallel Plates, set one within another, and straited a-crofs. They are compos'd of a talky Spar. Each Case is about $\frac{1}{15}$ of an Inch in Diameter; and consequently each Partition about $\frac{1}{2} \times \frac{1}{8}$. This very elegant and extraordinary Body was found loose upon the Shores betwixt the Minifter and Warden in the Isle of Sheppy, Kent. There were many other like Bodies lying scattered upon those Shores for a Mile or two together; which were generally broken, worn and fretted by the Motion and Agitation of the Sea; of which there are plain Indications upon this here treated of. They are all lodged originally in Beds of Clay in the adjacent Cliffs, whence they are beaten down by the Insults of
of the Sea in Storms and high Tides. I observed several lying in those Cliffs: and caused some of them to be taken forth. They lay all flat-wise, or in an horizontal Posture. They were of several Sizes. The least I took notice of, was not above two Inches in breadth: the largest about two Feet and a half broad, four Inches and a half thick, and pretty near round. Viewing several of those that appear'd in the Brow of the Cliffs, and were actually lying in the Strata, entire, unworn, and in their native and original State, I found the Ends of the Tali naked, and that they did not differ considerably from those that lay loose on the Shores; nor could I find one of these Bodies here invested with an exterior stony Crust, as those found near this City commonly are. The most regular of these Bodies I ever saw, was at my return to Town, after my Travels thorough England, in the Collection of Mr. Conyers; what is become of it now, I cannot tell. This was flat, about a Foot and a half broad, three Inches thick, and near round. The Tali were almost all of near the same Size: and their Sides near equal. The Stone that constituted them was very close and hard, of a Foliotmort Colour: and the Partitions and Crusts of a dusky Yellow. This also was found somewhere upon the Shores of the Isle of Sheppy.

*xd. 2.* Another, little different, only less, and composed of fewer Tali. Found on the same Shores. Part of this is polish'd.


*xd. 3.* A single pentagonal Talus, consisting of the same sort of Stone with that of the two foregoing: and cover'd on all the five sides with a yellow Crust. 'Tis two Inches and \(\frac{1}{2}\) in length, and about one Inch and \(\frac{1}{4}\) in Diameter. Found on the same Shores.

*xd. 4.* Two Tali, one of them Quadrangular, the other Quinquangular, consisting of the same sort of Stone with the former, having in it small Sparks of Crystal. Each is invest'd with its proper Crust: yellow, and like that of the foregoing. Found on the same Shores.

*xd. 5.* A piece of a *Ludus Helmontij* near Square, worn and ground by the Agitation of the Sea. On one side of this Body, two of the Partitions, crossing it in the middle, divide it into four near equal Parts. 'Tis observable that some of the Partitions do not quite pass the Body: and those that do are so thin as to appear only like a small white Line on the opposite side of the Stone. In the Mass of the Tali, appear some small Flakes of Talc. From the same Shores.

*xd. 6.* Another piece, of an oblong form, worn in like manner; and divided on one side, by the Partitions intersecting in the Umbilicus of it at near right Angles, into four Parts. On the other side 'tis cover'd by a Crust. The Stone of the Tali is, in this, of a somewhat lighter brown Colour than any of the former. From the same Shores,

*xd. 7.*
Another *Ludus Helmontij*. In this the Tali are smaller than those of any of the foregoing, of a grey Colour, and the Stone softer. Found in a blue Clay in a Lane on the West side of Sherborn in Gloucestershire, going down the Hill to the River. 'Tis of a compress'd oval Form, two Inches long, and one and a half broad.

Another piece of a rust Colour. The Partitions of this do not every where pass the Body of the Stone, so as to part the Tali, as in the former. 'Tis worn by the Working of the Sea: and was found upon the Shores near Burlington in Yorkshire, where they are very plentiful. This sort is indeed found all along the Shores of this Coast, from Burlington, Flamborough-Head; and thence quite to Scarborough, where are several found, near the Spa, on the Shore.

A large piece, in which several of the Tali are separated from the Partitions, and are wanting, the Cells or Places of them being empty. Those that remain are of a dark brown Colour, the Partitions are, as in the other, composed of several Plates, but more gros than in any of the rest. They appear outwardly of a reddish Colour. One or two of the Cells seem to have been fill'd with a talty Spar, which is pellucid with a dusky yellow Cast, and indeed seems to be much of the same sort with that of the Partitions. One of the Tali had a *Cornu Ammonis* immered in it, a Joint of it being very evident; and I think the Edges of the Shell. In a Gravel-Pit near Oxendon-Church. Mr. Morton.

I found pieces of *Ludus Helmontij*, very like this, by a Brook on Hamstead-Heath: as also in a Clay-Pit, at Harrow on the Hill.

Another, not so big, of an oval Figure, and worn by the Sea. The Tali are part of a light brown Colour, and part of a darker, spotted with Grey, the Spots being only the Ends of Tubes fill'd with a grey Stoney Matter. They are of that sort which Dr. Grew calls the *Piped Waxen Vein*. (Class IV. Part 4.) The Cases of the Tali are of the same Matter and Colour with those of x.d. 1, and 2. but stand further atunder, being diancled by the Interposition of a middle Partition, that is in some places of an Inch over. This consists of the same sort of Matter with that of the *Pyrites*: and is for the main of a dusky Hue, but in some Parts yellow and glittering. In some Parts of the Body that middle Partition is discontinued: and the Spaces there left empty; where the two opolite Surfaces of the Sparry Cases, on each side those Spaces, are shot into *Tuberculosis* & *Efflorescencies*. Shores of Sheppy Island, near Minster.

A small Piece of a *Talus* of the *Ludus Helmontii* of a brown Colour, with Part of a yellowish semidiaphanous Crust adhering to it. Upon the Outside of the Crust is a Cluster of crystalliz'd Grains of *Marcasit*, small, and all tending towards a cubic Figure; From the great Tile Clay-Pit near Richmond-Well.
A large Piece, of a somewhat darker Colour. On one side is a large Segment of a shining Crust striated a-crofs adhering to it. On the Outside of it, at some distance from each other, are three Studs, each about $\frac{1}{4}$ Inch in Diameter, of a bright shining yellow Brass-like Marcasit, set all over with small square Baffy Scales. The Sparry Plate, as well as the Marcasit, is florid, and crytallized; the Crack, in the middle of the Body, in which they were form’d, being capacious, and affording room for these Crytallizations. All the Tali of this Body were variegated with a light Brown, and a dark Grey. From the same Clay-Pit.

Another, with two like Efflorefcencies of Marcasit standing so close, that they intrench somewhat upon one another. From the same Clay-Pit.

Another, very small, with a like hemispherick Marcasit affix’d upon it. Tho’ this Marcasit be of the Bigness of those above, the Scales upon its Surface are much less. ’Tis broken, and appears within to consist of Baffy Threads, or Striae, tending from the Surface of it to its Center. From the same Clay-Pit likewise.

A Piece of a Talus of the Ludus Helmontii, cover’d with a yellow Crust, on one side of which grows a white semipellucid talky Spar; composed, much like the Marcasit in the foregoing Body, of several small Filaments tending towards the same Center. Upon which account, Dr. Grew calls another like Body the Star’d Waxen Vein. (Museum Reg. Soc. p. 312. &c Tab. 21.) The Starry Crytallization is $\frac{3}{8}$ of an Inch over. The Surface of the Sparry Crust, upon which the Star is affixed, is tuberous and florid; the Crack in which the Crust and Star were form’d being capacious, and allowing room for those Efflorefcencies. This, as also that of Dr. Grew, was found upon the Shores of the Island of Sheppy, Kent.

A flat Stone, made up of many Tali irregularly pentangular. They are small, generally not above $\frac{3}{10}$ of an Inch in Diameter; and of a light brown Colour. They seem to be of a firmer and clofer Constitution, than those of any the precedent. The Partitions pass through the Body of the Stone, appearing in much the same manner on the two opposite Flats of it. They are of a Colour darker than that of the Tali, and composed of a ferruginous or ochreous Matter. They are very thin; being only like so many pentangular Lines, little broader than an Horse’s Hair, describ’d upon the two flat Surfaces of the Stone. This elegant Body I found upon the Shores of the Island of Thanet, near the North-Foreland.

Another, of a rounder Form; otherwise little different. It seems to have been worn by the Motion of the Sea, and by that means reduced to a rounder Form. Found along with the foregoing.
x d. 19. Another, small, of a compress’d oval Shape; and a light brown Colour. Upon each of the two opposite Surfaces appear several black Lines, describing irregular angular Figures. These are only the Edges of the Septa; which, in this Body, are very thin. This was found on the East Shore of the Isle of Grains, near the Ostium of the Thames.

x d. 20. Another. In this the Partitions are of a whitish Colour, with a talky shining Gloś. The Tali of a light Brown. Found alone in the Road at the North End of Masham, Yorkshire.

x d. 22. Another, in which the Partitions are in some parts near \( \frac{2}{3} \) an Inch thick, of a dark Colour, glossy, and composed of Filaments, running parallel and transverse to the Planes of them. The Tali are of a dark grey Colour, and very hard. From Crick in Northamptonshire. Mr. Morton.

x d. 23. Another small Piece from the same Place, and not different, only it has a triple Partition, two Plates whereof are of the same Texture and Colour with the former, and each about \( \frac{2}{3} \) of an Inch over; between which is interposed a Plate of a very white talky Spar, about \( \frac{1}{8} \) of an Inch in Thickness.

x d. 24. Found near Cow-Ashby, Northamptonshire. The Tali of this are of much the same Constitution with that of those found in Sheppy-Island, x d. 2. & seqq. The Septa are composed of a grey glossy Spar; which, in one of them, is crystalliz’d, and run into trigonal Shoots.

x d. 25. Part of a Ludus Helmontij, in which the Tali are of a very dusky brown Colour, near black, appearing to hold Iron, as several of these Bodies do. The Septa seem to be composed of various thin Plates, they being all lineated length-ways. They are striated across, in a manner not very unlike that of the Crusfs of the Hematites. There are Sea-Shells immersed in several parts of it; one of which seems to be intersected by a Sparry Septum. If that be really so, twould be a Proof that the Septa and Tali were not form’d at the same time; but that these Bodies have been burst or chink’d since their first Consolidation, and the Chinks afterwards filled with a Sparry Matter that infiltrated itself into them. When ’tis expos’d on the Surface of the Earth to the Air and Weather, it shatters and falls to pieces. Of this there were several Instances in the Heap flung by the Workmen out of the Tile Clay-Pit where I found this Body; which is upon the very Top of Shooter’s Hill. There are several Clay-Pits upon and about that Hill; and the Ludus Helmontij is found in most of them. By the Samples I saw there of that Body, it appears plainly to have been a Nodule; and most of those I observed in that Place, were externally invested all over with Crusfs, from \( \frac{2}{3} \) of an Inch, to an Inch in thickness, composed of a pale brown Stoney Matter. The Bodies were of several Sizes, up to the Bigness of a Man’s Head. In the Cliffs of Sheppy Island, I formerly took notice of several that were much larger; of which see x d. 1. supra.

x d. 26.
x d. 26. A Piece of one of the aforementioned Crufts. From the same Clay-Pit.

x d. 27. Part of another Ludus Helmontij, little different from that x d. 25. and found in the same Pit. 'Tis observable, that there is in this a Suture, running cross one of the Septa, where another comes up to and joins it. There are inclos'd in this also several small Bivalves, of the same Kinds with those commonly met with in the Sand-Pits and Clay-Pits about Black-Heath.

x d. 28. Part of a Ludus Helmontij, of a pale brown Colour. In this, and in several others, I saw in the same Pit, is a Mixture of Matter that is yellowish, and in Consistence very like Yellow-Ochre. The Partitions are striated across; and, as they tend towards the Cruft, they gradually lessen. One of them also divergences to two; and another into several small ones. The same I observed in others of these Bodies there. They sometimes enter into the Body of the exterior Cruft: but I never saw any that quite pass'd it to the Surface. This Piece was found in a Tile Clay-Pit near Peckham, in Surrey. I observed here, in some of these Bodies, those fuliginous Delineations of Shrubs, call'd commonly by Writers Dendrites; and these upon the Tali, on each side the Septa. Most of these Bodies here were externally cover'd with a Cruft. They were of all Sizes to the Bigness of an Horse's Head: and generally of a compress'd or flattish Form. I observed in the same Pit, other Bodies of like Form and Bulk: but constituted of a gritty Sand, and composed of Crufts alternately grey and brown, in manner of the Bezoar Minerale.

x d. 29. Part of another, the Tali of a deep brown Colour, with a Blush of Purple, very like some Iron Ores, and seeming to hold some of that Metal. The Septa, or Partitions, are striated, both long-ways and cross-ways; and upon one there are vestigia of Sutures, where the other cross Septa come up to, and join it, as in x d. 27. Out of a Tile Clay-Pit at Norwood, about a Mile from Croydon, Surrey.

x d. 30. A Ludus Helmontij, the Tali outwardly of a pale brown Colour, and grey within. The Septa terminating sharp, in Edges, on all Sides of the Body. Where broken, they appear to be striated both length-ways and cross-ways. This Body seems to be intire, and not to have been invested with a Cruft. Out of the great Clay-Pit at Richmond, Surrey. These Bodies are found in this Pit in great Numbers, and of all Sizes, to double the bigness of an Horse's Head. The greatest part of them are invested with Crufts. In breaking several of these, I observ'd, immers'd in the Mass of the Tali, Sea-Shells, both turbinated and bivalve, of the very same sorts with those commonly found lodg'd in the Clay of this Pit. These Bodies, when expos'd to the Air and Weather here, and in the other Tile Clay-Pits of Middlesex and Surrey; in most of which they are found, shatter, in time, and fall to pieces.

x d. 31. A Piece of a Ludus Helmontij, in which the Septa are of a dark grey Colour in the Middle, and white on each Side. From the same Clay-Pit, at Richmond.
Another, that appears to have been expos'd to the Weather, and fretted. In this the Septa gradually lessen, and come to an Edge, as they approach the external Crusft. From the same Clay-Pit.

Part of a Talus of another, still from the same Clay-Pit. The Septum, adhering to the Surface of this, is shining, glossy, and appearing very much like Velvet. 'Tis indeed little different from that on x d. 13, and x d. 14. only the Colour is deeper, or more dusky than in those.

A Fragment of a Ludus Helmontij, found in a Brick-Clay-Pit North of Lamb's-Condurt. The Surface of the Septum, adhering to it, is glossy, and much like that of the precedent. I observed in several of the Masses of Ludus Helmontij in this Pit, the Septa were, in some Parts of the Body, discontinued, and the Spaces not fill'd: but empty, in form of Cracks.

Part of a Ludus Helmontij, the Talus brown; but externally, and where contiguous to the Septa, of a dusky Iron-Colour. (Conf. x d. 41. infra.) The Septa are finely plated, and striated across. Found in a Tile Clay-Pit, at the South-East Side of Highgate. This was broke off that x d. 43.

A Talus, with part of two or three others adhering to it; as also the Septa, which are plated, and striated across. In this there is a Vacancy in the middle of one of the Septa, in form of a Crack or Vein: and the Plates on each side have the Surfaces glossy, like those mentioned x d. 33, and x d. 34. This Gloss, and various Reflection of the Light, arises from the shooting of the Spar into extremely small Crystals, on the two opposite Sides of the Crack; that Crack allowing it room to shoot and crystallize in. Which doubtless was the Case of all the Plates that are found with their Surfaces thus crystalliz'd. (Confér. x d. 11. supra.) From the same Pit with the foregoing.

Part of a Ludus Helmontij, found amongst several others in a Tile Clay-Pit, about two Miles from Layton-Stow, in Epping-Forest. In this the Septa, passing from the Center towards the external Crusft, become gradually less: and, in one part, there arise from the Surface of a Plate, Crystals somewhat larger than in any of the foregoing Bodies.

Part of another Ludus Helmontij, from a Brick Clay-Pit between Marybone and Soho. The Sparry Partitions, in this, approaching towards the Outside of the Body, grow gradually less: and one of them divides into four smaller Branches. These Bodies in this Pit, in that on the backside of Gray's-Inn, those by Hogdon, Islington, and some others that lie North of the Town, are commonly round: and of a flat or compres'd Shape. In these the Septa run ordinarily across them: and are largest in the Middle; gradually lessening as they approach the two opposite Flats. Some I observ'd, in all those several Pits, in which there were only transverse Cracks, without any Spar at all in them to compose the Septa. Some others, like Ludus Helmontij, with like Cracks
Cracks in them, I observed in a Tile Clay-Pit at Holloway, near Highgate.


x d. 40. Six Pieces of a Ludus Helmontij, in which are immersed great Numbers of a fort of Pectunculus. The Septa passing towards the exterior Crust gradually lessen, as in the precedent. Several of the Shells are broke; and have the Septa directly passing thorough those Breaches. This imports that the Stone was broke after 'twas consolidated, and the Shells incorporated with it; and that the Spar, that constitutes the Septa, only succeeded and fill'd up the Cracks. Cryftal is one of the most obvious Minerals of this Country; and the Fissures of the Strata of Stone in most parts of England have considerable Quantities of it, partly pure, but much more commonly mix'd, and in form of Spar, collected and drain'd into them. This was reposited, originally, dispersedly, and in single Particles, or at least very small Molecules, in the Interstices of the Sand that composes those Strata of Stone. They must have been extremely small, or they could not have pass'd the Pores and Interstices of the Stone, as 'tis apparent they did, in order to get into the Fissures of the Strata of Stone, the Cracks of the Ludus Helmontij, and other Bodies. These Crystalline Particles are, in like manner, mingled and interspersed among the Earth, Clay, or other like Matter that composes the lacier Strata. Now the Parts of this Mineral being small, light, and disposed to be moved along with the Water and Humidity which is continually passing the Strata, it is commonly derived and drain'd out of them, and convey'd and reposited in the Cracks and Fissures of Stone. For these give way to the Motion of the Water; which therefore naturally tending towards them, carries the sparry Corporcles along with it thither, where there is Room and Reception for it, and where it affixes and concretes to the Stone on the Sides of the Cracks and Fissures. By this means the Spar, and other Mineral and Metallic Matter, is brought into the perpendicular Intervals of the solid Strata*. By the same means the sparry Veins are form'd in several sorts of Stone; as also these Septa in the Ludus Helmontij. I have taken notice elsewhere (o. 105. infra) of a fort of Spar composed of Cryftal and Lac Lune. This, that constitutes these Septa, is composed of Cryftal, with an Intermixture of a fibrous Talc. There is likewise a flight Proportion of other Matter, sometimes Mineral, and sometimes Metallic, in several of them; nay, some of them seem to hold some small share of Vitriol in them.

The Septa in this, and other of these Bodies, gradually lessen as they approach the outer Crust, and terminate without ever reaching it: as do also the Chasms or Cracks, of which there is an Example in the foregoing; but the Bodies might have been crack'd in their interior Parts, and yet the Cracks not always extend to the Surface. Of this we have Proofs and Instances in the cracking of Clay, and of Timber, as they dry, and certain Parts growing closer, quit others. In Timber, or Trees fell'd, upon the Sun's drawing forth the Sap, the Knots are the aptest to crack. Again, Spray-Wood in charring, parts frequently into various Cracks, made from the Axis of the Spray towards the Surface; but terminating before they reach the Surface. Which is the very Case of those Ludus Helmontij, whose Cracks or Septa do not pass the outward Crust.——In Lud. Helm. f. 434. of the second Part of this Catalogue, one of the Septa, approaching a firm robust Shell, fill'd with a very hard Pyrites, divides into two; so as to attend the Surface of the Shell, encompass it, and take the Impression and Figure of it. From a Tile Clay-Pit on the East-side of Highgate, near the top of the Hill, which indeed appears to be the highest Ground thereabouts for several Miles round. The Shark's-Tooth, No. 69. of the second part of this Catalogue, was found in the same Pit. These here, the Sharks-Teeth found on one of the highest Hills in Epping-forest, ibid. No. 70. those found at Harrow on the Hill, No. 67 x. and those found in that Hill above Richmond in Surrey, No. 64. along with a great Variety of Sea-Shells, afford us Instances of Remains of the Deluge in several of the highest Parts of the Country hereabouts. Like Instances there are, in the other Catalogues, of those Remains deposited in the highest Hills of the other Counties of England; as well as in those of foreign Countries.

x d. 41. Part of a Ludus Helmontij of that flat sort mention'd x d. 38. Found in a Brick Clay-Pit, North from Grays-Inn, near Pindar of Wakefield. 'Tis broke thro' the middle; from whence the Septa, tending towards the Surface, gradually lessen: and terminate before they reach the Crust. The Tali are of a grey Colour, as also the Crust; only this has withal a Caft of brown. There were, as in Flints*, and many other Fossils, in this, and others of these Bodies, several Cracks, so fine as not to appear to the naked Eye, only the Bodies in breaking, easily part, and fall to pieces at them; and the Bodies on each side the Cracks are tinged with a reddish or Iron Colour. But neither those Cracks,
nor that Colour, pervaded the external Cruft. *Conf. x d. 35. supra.*

x d. 42. Part of a Cruft of a *Ludus Helmontij*, of an ochreous, or yellow Colour; appearing to be composed of numerous thin parallel Plates. 'Twas not so firmly join'd, but that it parted easily from the interior Body, as if there was only a lax and light Adhesion of the Cruft to that Body; the *Tali* of which were of a Rust Colour. From a Tile Clay-Pit, in a Field near Pancridge. The *Ludus Helmontij* that is invested with a Cruft, originally, before 'twas crackt, and the *Septa* form'd, appears to have been nearly related to the *Bezoar* Mineral. And indeed those mentioned, x d. 28. supra, are no other than *Ludus Helmontij* not crack'd.

x d. 43. A large Piece of a *Ludus Helmontij*, part of the same with that x d. 35. The Body was of a flat compress'd Form, roundish, and very large; being, in most parts of it, about 14 Inches thick, and near 3 Foot broad. It lay in the Bed of Tile-Clay, about 8 Foot deep, flatways or horizontally, as did those I observed in the Cliffs of Sheppey Island; and indeed all the Flints, Pyrites, and other Nodules, (all which were form'd in the Water at the Deluge, before the Subsidence,) that are of like Shape. The Fossil Bivalves, and other flat Shells, lie generally in the same Posture into which all these would naturally settle at their Descent from the Water. These broad flat Bodies being thus found universally in all Parts of the Earth repofited flatways, or parallel to the Strata in which they lie, is one of the many Arguments there are, that they, and the Matter amongst which they lie, subsided from a Fluid in the same manner all round the Globe. In this Piece the *Septa* are very finely plated, and striated across. Tending towards the exterior Surface they gradually lessen, and some of them dilate into small Branches. Found in a Tile-Clay-Pit on the S. E. side of Highgate, Middlesex.

x d. 44. Another Piece of the same Stone.

x d. 45. Part of a *Ludus Helmontij*, also from the same Pit. This shews very fairly the gradual Diminution of the *Septa*, as they approach the Surface of the Body, as also the Manner of the Application of the Spar to the *Tali* on each Side the Cracks, and the succesive Formation of the several Plates that compose the *Septa*; which indeed the following and several others do.

x d. 46. Another from the same Pit; the *Septa* finely plated, and striated.

x d. 47. Another, likewise from the same Pit. Thorow the middle of one of the *Tali* of this there passes a thin *Septum*, that also passes and interfects one of the larger or common *Septa*. The Crack, which this *Septum* fills, was apparently made, not only since those Cracks in which the larger *Septa* are, but even since

† *Conf. Nat. Hist. Earth, Part iv. Conf. 2, 3. where these Particulars are made out.*
those larger Septa themselves were formed. Of this there are also like Instances in the three following Bodies. Indeed the Partitions in the "Ludus Helmontij appear not only to be made by the cracking and starting of the Parts, but 'tis manifest that those Cracks were made by the Body shrinking and contracting at different, and considerably distant, times, successively, each after other.

xd. 48. Another from the same Pit.
xd. 49. Another from still the same Pit.
xd. 50. Another, from the same Pit also.
xd. 51. A "Ludus Helmontij, with part of the Crust broken off, to discover the interior Constitution of it. 'Twas of an oval Figure, near one Foot in Length, and above $\frac{1}{2}$ Foot over. The Septa are veined, and striated across. Passing towards the Crust, they gradually lessen; from still the same Pit. The Mass of the Tali is in some Parts of a light brown, and in others of a dark grey. Even the different Parts of the same Talus are of those two different Colours, and the Cracks and Septa uncertainly and indifferently pass both.

xd. 52. Part of another, less, from the same Pit. 'Tis of a compressed Form, the interior Parts are of a deep brown, and the Crust of an ochreous, or light brown. The Septa generally pass cross-ways, and from Flat to Flat, gradually lessening towards each Extreme, as they approach the environing Crust. I have observ'd very many of the "Ludus Helmontij of a grey Colour, in the Clay-Pits in the Fields all along the North Side of London, from Hockendon to Paddington, that have the Septa of like Constitution, and crossing the Bodies in the same Manner.

xd. 53. A "Ludus Helmontij, of a flat compressed Shape, 9 Inches in length, 7 in breadth, and 2\frac{1}{4} in Thickness, in the middle, from which it gradually thins, and lessens towards the Edges. The Stone is very compact, hard, and of a dark grey Colour. The Septa are of a talky Spar; white, with a Cast of Yellow. They are very numerous, and stand very thick in the Stone. From Low-Eastoft in Suffolk.

xd. 55. "Ludus Helmontij, the Stone of a very pale brown Colour, the Septa white, with a Cast of yellow. The Surfaces of the Plates that constitute those Septa, are in some Parts shot into extreme small Crystals. Where this happens, there are betwixt the Plates, Hollows and Intervals, where commonly the Stone parts in breaking, which this also did, except only on one Part, where one of those Intervals is observable. This was found, among several others, about 12 Foot deep, in sinking near the White-Tower, within the Precincts of the Tower of London.
Lapis Syringoides, s. Tubulis retortus. The Piped Waxen Vein*. With an Appendix relating to the Piped Pyrites.

EXTRACT.

C. 1. Of the Tubuli or Pipes.
The Pipes are of a yellow Colour with a Coat of green. \(\pm d. 1\).

— and are composed of various Crusts, including one another, and striated across; like the Septa of the Ludus Helmontij. \(\pm d. \ 3.5\).

They consist also of a talky Spar, much like that of those Septa; \(\pm d. 1\).

— and are most of them about the Thickness of a Swan’s Quill. \(\pm d. 1\).

— generally round, but some of them compressed. \(\pm d. 1.10.14\).

They lie ordinarily all the same way, and parallel to each other. \(\pm d. 1\).

— tho’ sometimes they vary in their Postures, and lie cross one another. \(\pm d. \ 9.13.21.22\).

They are commonly pretty straight. \(\pm d. 1. \& seq\).

— but some of them are inflected. \(\pm d. \ 12.18\).

They are not ever in equal Number in all Parts of the Stone; but lie thicker in some Parts than in others. \(\pm d. 15\).

In some of these Bodies they are covered with a fine Reticulum of a blackish Colour, and rise into various round Tubercles. \(\pm d. 14\).

Many of them are empty, and parted into Cells, by transverse Diaphragms. \(\pm d. \ 1.2.3.18\). Conf. Cl. 5. § 2. Part 2. infra.

The Cells are thick set, and lined with small Crystals, like those of the Septa of the Ludus Helmontij, where the Plates part so as to leave an Interval for those Crystals to shoot in. \(\pm d. 5\).

Some of them are filled with a grey stoney Matter, \(\pm d. 1.10\).

Others with a white talky Spar. \(\pm d. 9\).

Others with a Pyrites. \(\pm d. 1\).

Some of them are composed of a Crust of Pyrites within a Crust of Spar. \(\pm d. 8.15\).

Others consist entirely of a yellow shining Pyrites. \(\pm d. 18. \& seq\).

* Dr. Grew, Museum Reg. Soc.
In some, the tubular Pyrites, tho' within of a brassy shining Constitution, are externally Black, and striated lengthways, partly empty, only having in them various Effulences of the Pyrites, very bright, fine and glittering with yellow, green, blue, and other Colours, and partly filled with a grey stoney Matter. + d. 16.

C. 2. Of certain Partitions in this Body, like those of the Ludus Helmontij.

In some of these Bodies are Septa of a yellow talky Spar, not differing from that of the Tubes. They are composed of various Plates, striated across, and exactly of both the same sort of Matter, and the same Constitution with the Septa of the Ludus Helmontij. + d. 5. 7. 10. 23. Conf. + d. 5. & o x. d. 40. Append.

The Surfaces of these Septa are sometimes thick-set with crystalline Shoots, exactly like those of the Septa of the Ludus Helmontij. + d. 17.

And sometimes likewise rise into small botryoid Tubercles, like those of the Hamaerites, which the Surfaces of the Septa of the Ludus Helmontij likewise sometimes do. + d. 7.

C. 3. Of the Stone in which the Pipes are immers'd.

A black Stone, with Sparks of a brassy Pyrites in it. + d. 13.
A grey Stone thick set with small Tubercles. + d. 11.
A Stone, in some Parts brown, in others grey. + d. 10.
Another like Stone with Pyrites in it. + d. 14.

Some Instances there are of this Stone of a brown Colour, and composed of Fibres, running all across to the Site of the Pipes. + d. 1.

Others composed of Fibres running lengthways, or parallel to the Pipes. + d. 5. 6.
A few there are that resemble petrify'd Wood. + d. 10.
As also that resemble char'd Wood. + d. 12.

Some of these Bodies, like the Ludus Helmontij, are externally covered over with a stoney Crust. + d. 11. 13. & seq.


These Bodies are frequently found lodg'd in Beds of Clay along with the Ludus Helmontij; and, as several of that kind, so some of these also are externally invested with a stoney Crust. + d. 11. 13. 14. 15. The Pipes differ indeed in Form from the Septa of the Ludus Helmontij, but they agree with them in all other respects. e.g. They consist of various Crusts, set one within another. These are striated across, and composed of talky Spar, of the very Colour and Constitution of that of those Septa. This Spar is crystalliz'd also, in like manner as in those, and has sometimes Crusts of Pyrites of the same sort that those have. Nay, there are Instances of this Stone's being intersected by Septa of the same Nature.
Nature and Texture with those of the Ludus Helmontij. In fine, 'tis without Contest, that the Lapis Syringoides is a Nodule, and was formed at the same Time, and by the same Means that all other Nodules were*. But as to the Pipes in it, the Samples I have met with, and the Observations I have hitherto had opportunity of making, have not exhibited Phænomena numerous enough, or afforded Light sufficient, either to clear the Natural History of them, or determine my Judgment as to their Origin, which therefore must be suspended and reserved to future Enquiry.

Mean while, if I might be permitted to offer a Conjecture in so abstruse and uncertain an Affair, it should be, that as the Ludus Helmontij, and the other Nodules have in them Sea-Shells that were incorporated with them during the Time of their Formation in the Water at the Deluge, so these Stones had then incorporated with them tælastaceous Tubules, related to the Siphunculi, or rather the Vermiculi marini. And there are several of them, particularly that § d. 3*, that exactly resemble those Bodies, and are not to be distinguished from them. That Stone likewise § d. 12, has in it several Tubules that appear to be not sparry, but really tælastaceous. Now if there were thus tubular Shells originally incorporated with, and immersed in the Stone, they might be eroded, and in tract of Time quite dissolved by the Vitriolic Salts, with which the Pyrites abounds, and which are so plentiful in the Clay of that Pit near Richmond, wherein the greater part of these Bodies were found, as to impart a purging Quality to the Water that arises out of it. And as much of the said tælastaceous Matter of the Tubules as was so eroded, would be successively, in the usual manner, supply'd by Spar, brought by little and little, and deposited in the room of it, by the Water that is ever more or less impregnated with sparry Matter, and is continually pervading the Strata. Or, where that Water happen'd to be more copiously saturated with the Corpuscles that constitute the Pyrites, it would deposit them, and so form the Tubular Pyrites. At least it is very certain, that this was the Case of several sparry Bodies in form of Concha, Cochlea, and other Sea-Shells, of which there are many Instances in the second Part of this Catalogue. § d. 23.

* Vide Nat. Hist. of the Earth, Part iv. Conf. 2. 3.
CLASS IV. PART V.

Lapis Syringoides, s. Tubulis refertus. The Piped-Waxen-Vein. With an Appendix relating to the Piped Pyrites.

§ d. 1. A flat Stone, broken so as to shew the interior Constitution of it, in which are several Tubes, most of ‘em straight, and lying parallel to each other. They are chiefly of a yellow Colour with a Coat of green, and run through the whole Length of the Stone, which is 4 Inches \( \frac{1}{2} \). The Thickness of the Sides of the Tubes is about one 20th of an Inch; the whole Tube generally about the bigness of a Swan’s Quill, only some few there are less. Most of ‘em are empty, and are parted at some Distances into several Cells, by Valves, or rather Diaphragms, consisting of the same Matter with the Tube. A few of them are wholly filled with a grey Stoney Substance, and one or two with a Pyrites. The Stone in which these Tubes are contain’d is of a brown Colour, and is made up wholly of Fibres which run directly transverse to the Position of the Tubes. From the Shores of Sheppey near Minster.

§ d. 2. Two Tubes broken off from the foregoing Stone: and shewing very plainly the Diaphragms above-mention’d. The Tubes of these, and of several of the following, are composed of various Crusts, including one another: and striated a-crois; like the Septa of the Ludus Helmontii.

§ d. 3. Several Tubes, some straight, others crooked, lying together in the manner of the Shells of Vermiculi marini. There is in the Middle one larger than any of the foregoing. There is little Stone with these. From the same Shores.

§ d. 4. A Mass of Stone, like that § d. 1. with several Tubes in it somewhat larger than those in that. From the Shores of Sheppey Island.

§ d. 5. Another Stone, in which the Tubes are of much the same Size, Colour, and Matter: and plac’d in the same manner with those of N° 1. Only there is one transverse to all the rest, and is double, having a smaller Tube included in it, the End where broken appearing not unlike one of the crusted Belemnites. The Stone in which these Bodies lie, is of a much darker Brown than N° 1, but consists of Fibres, not transverse, as that does, but parallel to the Length of the Body, and the Generality of the Tubes. This being broke, parted at a Plate of like Constitution...
with the Septa of the *Ludus Helmontij*; where doubtless was a Crack; and the Sparry Matter successively filling it, form'd the Plate; which is of the same Colour and Matter with that of the Tubes. Its Surface rises up every where in small Bubbles, not unlike those of the Botryoid Hammites, No. 0.42. and is striated a-crofs, as the Tubes in this Body, and the Crufts of that Hammites are. Found in the great Clay-Pit by Richmond-Wells. The Tubes consist of various Crufts, striated a-crofs; and having the Bore or Cavity thick set with extreme small Crystals, like those in the Intervals of the Plates of the *Ludus Helmontij*.

† d. 6. A Piece in which the Tubes differ little from those of the immediately foregoing; and the Stone in which they lie, is striated length-ways, as that is. From the Shores of Sheppey, betwixt Minster and Warden.

† d. 7. Another, with a Cruft upon it of the same nature with that of the Tubes, rising up into several Bubbles, cluster'd together, and set all over with extreme small crystalliz'd Shoots of the same Matter. From the great Clay-Pit at Richmond-Wells.

† d. 8. Another, in which some of the Tubes are lined, and others fill'd with a glittering *Pyrites* of a Copper-Colour. From the same Clay-Pit.

† d. 9. Another, very much worn, and ground by the Motion of the Sea. This is very thick set with Tubules in various Positions, most of 'em smaller than those of the foregoing, and fill'd, some with a grey Stoney Matter, and others with a white Talky Spar. From the Shores of Sheppey Island, Kent.

† d. 10. A large Stone, in some places grey, in others of a dusky Brown: with Fibres all placed length-ways of the Stone, and very much resembling petrified Wood. In the brown part of the Stone, there appear several thin Tubes, some round, others of a compress'd Shape, all fill'd with the same sort of grey Matter that the other part of the Stone consists of. There are in it a few Veins of a yellowish Talky Spar, of the same kind with that of the Tubes mention'd above. Upon the Shores of Sheppey.

Vide † d. 14.

† d. 11. A grey Stone, the Surface of which, on one side, rises into several round Knobs, about the bigness of Peas, set very close together. Whether they be the Ends of the Columns of Matter, filling tubular Bodies, like those before mention'd, is not easy to determine; but they seem not to pass deep into the Substance of the Stone. Found in the great Clay-Pit, near Richmond-Wells.

† d. 12. A large Piece of the *Piped-Waxen-Vein*. The Tubes in this, are much of the same Substance, Colour, and Size with those in † d. 1, but are neither so freight, nor do they lie all parallel to one another, as in that. Some of them are empty: and many fill'd with a Stoney Matter of the same sort with that, wherein they are immers'd; which, in some parts, is of a light brown Colour; in other, of a deep grey, and on one side of a dusky brown, with parallel Fibres, much resembling Chirr'd-
Wood, both in Colour and Texture. From the great Clay-Pit at Richmond.

†d. 13. Another. In this the Tubes are little different from the foregoing, but that they lie all together, very thick, and in various Positions in the middle of the Stone. The Part in which they lie, is near black, with some Sparks of a Brassly Pyrites in it. The Cruft inclosing this has no Tubes in it: and is of a light grey Colour. From the same Clay-Pit.

†d. 14. A Piece of Stone much like †d. 10. and with like Tubes also in it, some of them round, others compressed, and some very much so. The Tubes are coated with a fine blackish Reticulum. On one Surface the Tubes bunch out into round Tubera, like those of †d. 11. but bigger. Being broke on one side, there appears a considerable Quantity of a shining Brassly Pyrites. From fill the same Pit. Confer. b. 40.

†d. 15. Part of a large flat Nodule, gritty, and of a grey Colour. Thorough the middle of the whole Body pass’d a large Vein of a blackish Matter, thick set with Tubules, partly composed of Spar, and partly of Pyrites. That †d. 13. is of the same sort with this: and found in the same Clay-Pit at Richmond.

†d. 16. Part of a large Nodule, composed chiefly of parallel Pipes, of Pyrites, of a grey shining metallic Complexion. Externally they are blackish: and striated length-ways. The greatest part of them are fill’d with a grey Stoney Matter. In the few that are not fill’d, are Efflorescencies of Pyrites, very bright, and shining, partly yellow, partly of a flame-colour, green and blue. From the great Tile Clay-Pit, near Richmond, Surrey.

†d. 17. Another Piece broken off the same Body: as were also the five following.

†d. 18. Another. In this several of the Tubules are bended; some of them composed of Spar: and one divided into Cells, by means of transverse Septa.

†d. 19. Another.

†d. 20. Another.

†d. 21, 22. Two more, still broken off the same Body. In these the Tubules lie in diverse Positions: and some are placed directly cross the rest.

†d. 23. A Piece broke off a Nodule: that was of the bigness of an Horse’s Head; composed of a grey Stone, partly clear, and partly thick set with sparry Tubes, tapering, and much resembling the Shells of the Siphunculi marini. They generally lie parallel to one another; but some few cross-ways. In one Part of the Body is a Septum of Spar, striated a-cross, like that of the Septa of the Ludus Helmontij: and subdivided into several Branches, which lessen gradually as they approach the Surface of the Body. The Tubes and Septa are composed of Spar, of like Colour and Constitution. In one Part of the Body are numerous small Bodies, chiefly oblong, round, and in Form of Worms. They are black externally. Within, part of them are grey, consisting of Stoney Matter.
Matter, of like Constitution with that of the common Mass of the Nodule: and part yellow, and shining, being composed of Pyrites. Out of the great Clay-Pit. Richmond, Surrey.

CLASS IV. PART VI.

Belemnites. Vide Part VI. infra.

EXTRACT.

C.I. Of the Conic Belemnites.

§ 1. Of the Shape of this Body.

Conic, and terminating in a Point, *d. 1. & seqq.

A Suspicion that this Body is broken: and was originally pointed at both Extremes, *d. 45.

It is generally round, *d. 1. & seqq. 20.

In some a little flattish, or compressed. *d. 20.

§ 2. Of the several Magnitudes of the Conic Belemnites, *d. 1:


§ 3. Of the Colour of this Body.


— Of a dark Ash-Colour, *d. 12.


— Of a light Brown, *d. 1.

— Of an Amber Hue, with some degree of Diaphaneity, *d. 10. 11. 16. 17. 40.

§ 4. Of the external Constitution of this Body.

The Surface of the Belemnites is smooth. *d. 5.

Only it has usually one Chap or Seam running down one side, parallel to the length of it, *d. 40. 43. 44.

This, in some at least, passes on, tho' with a very fine Fissure, to the Middle or Axis of the Body.

§ 5. Of the interior Constitution of the Conic Belemnites.

It appears to consist of a Talky Spar, *d. 22. 29. 37.

And is compos'd of several Conoid Cortices, Cruts, or Cups including one another, *d. 1. 2. 4. 17. 19. 20. 22. 30. 31. 36. 40. 43. 45.

Those Cruts are all striated a-cross; they consisting of numerous Fibres, or Filaments, that pass them generally towards the Axis of the Body, *d. 1. 4. 6. 7. 8. 10. 11. 12. 14. 17. 18. 19. 20. 22. 25. 30. 31. 37. 38. 43. 45.

Thos' in some the Striae tend towards a Line placed near one side of the Body, *d. 17. 19. 20. 21.

Most of these Bodies have a conic Cavity in the middle. *d. 1. 2. 14. 17. 18. 19. 22. & seq. 37. 38.

This in some of them is empty. *d. 14. 17.
In others 'tis fill'd with Chalk. * d. 2.
— with Stone of the same sort with that of the Strata in which the Body is found, * d. 17. & 17. 22. & seq. 29. 43.
— with a greyish Matter.
— partly a black shining Matter, and partly white Spar, * d. 37.
— with a grey Alum-Mineral, * d. 38.
— with a yellow Brafs-like Pyrites. * d. 30. 31.
— with a grey talky Spar, and some Admixture of Pyrites, * d. 31.
— with a grey talky Spar, * d. 29.
— with a coarse Spar, * d. 26. 27.
— with a semi-pellucid Spar, * d. 25.
— with a white, diaphanous, crystalliz'd Spar, * d. 19.
This Spar in some is divided into several Joints, or Parts, that are at one end concave, and at the other convex; each gradually less than other, so as to form a Cone, and terminate in a Point, * d. 32.
The said Joints are sometimes of a harden'd clayey Matter, having in it Flakes of Talc, sometimes Sparks of a Pyrites, and being gilded with a shining Armature, * d. 32.
Sometimes of a blueish stoney Matter, * d. 29.
A Plate of a Selenites wedg'd or included in one of these jointed Cones, * d. 29.

§ 6. Several Accidents of this Body.
Some of the conic Belemnites have Vermiculi Marini, and other Sea-shells, adhering to their Surfaces, * d. 14, & seq. 23.
Some of them are crack'd, inflccted, distorted, and compris'd, * d. 17, & seq. 38. 44.
Some of them, particularly those found, beat out of the Cliffs, on the Sea-shores, have Holes in them like those made in Wood by Worms; and seem to be eroded, or scooped by Pholades, or other like Creatures, * d. 7. 41.
Sea-shells, Teeth of Fishes, and other marine Bodies, found lodg'd in the Strata of Chalk, Clay, Stone, &c. along with the Belemnites.

C. II. Of the Belemnites fusiformis, * d. 34. to 36 x, & c 40.
This sort is less than the Conic, * d. 34. & seq.
But is striated in the same manner, * d. 34. 36.
Consists of various Crusts, * d. 36. 40.
And has likewise a Seam running parallel to the length of it, * d. 34. 40.
Some of these are of a grey Colour, * d. 34.
Others of the Hue and Compleffion of Amber; with some degree of Diaphaneity, * d. 40.
C. III. Belemnites in Cuspodem utrinque terminans, *d. 45.

This also is composed of several Crucfts striated a-crois; and is, in Constitution, little different from the two precedent Kinds, *d. 45.

But none of these, that I have hitherto met with, have any Velsign of the Chap, or Seam, that the two former Kinds have, running length-ways of their Surface.

C. IV. Observations and Reflections.

The Belemnites is found lodg'd sometimes in Stone, *d. 22, & seq.

Sometimes in a blue Clay, *d. 40.

Sometimes in Chalk, *d. 45.

Those Fossils are of Constitution too much differing ever to give birth all to the same Body.

Besides the Matter of the Strata of Chalk, or Clay, and much more of Stone, would not have given way, or made room, after their Compilation, for the Formation of Bodies of the Bulk, to say nothing of the Texture, that some of these are of.

So that the Belemnites must have been form'd before the Strata were compiled.

They are every where found as much independent upon the Strata as the Sea-shells, Pyrites, Flints, and all other Nodules are.

For this reason, formerly, when I drew up my Essay towards a Natural History of the Earth, I concluded that they were mere sparry or mineral Nodules; and form'd before the Strata.

The latter of which Propositions is certain; and beyond contest. And 'tis as certain that nothing appears in the Constitution of any of them, that I have yet ever seen, but what is evidently of a talty sparry Constitution. But there are some of them, e. gr. *d. 14, & seq. 23., that have Sea-shells, and particularly of the Vermiculi Marini, adhering to their Surfaces. Now, tho' it be true that the same Accident is sometimes observable in other Nodules that are of irregular and uncertain Figures, and indisputably of mineral Origin; yet that is very rare: and, upon a closer Inspection and Examination of these Bodies, I observe that the Shells are affix'd to the Surfaces of them, in such manner as they are wont to the Surfaces of Bodies, lying now on the Sea-shores, upon which they live, thrive, and grow. So that I am not without some Suspicions that the Bodies upon which they are so affix'd, were form'd and existent before ever the Water of the Deluge came forth upon the Earth; and were of Animal, and not of Mineral Nature, as these now appear to be, and as I took them ever to have been. This is certain, many of the teffaceous and animal Substances, then reposited in the Earth, are since dissolved, their Compages destroyed; and succeeded by sparry and other mineral Matter, that at this day is exactly of their Shape and Mien; it filling the Places where they were, and so being circumscrib'd and determin'd.
termin’d in its Figure by them. Nay, there are some animal 
Substances, that are themselves also still extant, that yet have their 
Pores and Interstices so satured with mineral Matter, as to ap-
pear, to a less heedful Observer, to be wholly mineral. Of this 
I have some very extraordinary Instances among the Echini Spat-
gagi; some of which are so satured with spar’ry, and others with 
flinty Matter. From an almost endless number of Phænomena, 
I am satisfy’d that at the Deluge, all Fossils were so far dissolv’d, 
as to be reduc’d to their single Atoms and Principles; and that no 
two of these remain’d united or coherent. And those Principles, 
or Particles, in many Minerals, are small and fine infinitely, and 
beyond Expression. These were capable of being infinuated into 
the finest Pores of the animal Substances; and consequently so 
far eclipsing, absorbing, and disguising the animal Matter, that the 
Body should appear afterwards to be entirely mineral. And I leave 
it to further Observation and Scrutiny, whether these Bodies were 
not originally Horns, or other like animal Appendages; of which 
we see by the Aftéria, Entrochi, and many more, there are or have 
been vast numbers at the bottom of the Ocean, that never appear 
upon the Shores. Another Phænomenon I must take notice 
of; which is, that the Belemnites sometimes appear to have been 
compress’d, crack’d, and distorted; which is what I do not remem-
ber ever once to have observ’d in any Fossil that was not form’d 
in an animal Mould. But in these there are Instances of it; of 
which there are Accounts in the second Part of this Catalogue. 
After all, I cannot conceive how the Body, that was succeed-
ited by the Belemnites, should be dissolv’d, and the Shells, adhering to 
the Surface of it, not be dissolv’d likewise. ’Tis most probable 
that these Shells affix’d to the Body at the time of its Coalition 
and Formation, which happen’d to some other Fossils. Vide e. 67. 
infra.

Of the successive Formation of the Crusts of the Belemnites, 
*d. 43.


The Places where the Belemnites are found.

Greenhithe, *d. 1. 45.
Northfleet, in Kent, * 2, & seq. 45, 46.
Thurnham, Kent, * d. 36.
Croydon, Surrey, * d. 45.
Great Bowden, Leicestershire, * d. 16. *d. 32.
Ashley, Northamptonshire, * d. 32. x. 33.
Boughton, Northamptonshire, * d. 28.

† Vide Nat. Hist. of the Earth, 2d Edit. p. 25.
‡ See the second Part of this Catalogue, of the Extraneous Fossils, 
Chap. V. Part I. Sect. I. of the Echini Spat. h. 27. 32. 33. 40.

Sherburn,
CLASS IV. PART VI.

Belemnites.

* d. 1. A Belemnites of a light brown Colour, somewhat above two Inches long, and ¼ of an Inch in Diameter in the middle; from which it lessens equally towards both Extremes. At one of them it terminates, not tapering and gradually, but suddenly, in a Point; at the other 'tis abrupt, and ¼ of an Inch over, appearing to consist of three or four Crusts, let one within another, and having in the middle a round Cavity ½ of an Inch across. Found in the great Chalk-Pit at Greenhithe, in Kent.

* d. 2. Another, little different, only the Colour is somewhat lighter; and it seems to be made up of six or seven thinner Crusts. It has a Cavity at the obtuse End, as the other has, which in this is full of Chalk. In a Chalk-pit near Northfleet, Kent.

* d. 3. Another, less; from the same Chalk-pit.

* d. 4. Another, still from the same Chalk-pit. This is broken, and appears to be made up of several Fibres, transversely passing thro' all the Crusts, to the Axis of the Body.

* d. 5. Another, with its Outside very rough, as if eroded; the former, and indeed all these Bodies having their Surfaces usually smooth. From the same Chalk-pit.

* d. 6. A Piece of a larger, much rougher than the former, having in its Sides some Holes made, and those so great, as to reach almost to the Axis of the Body. This too is striated from the Surface to the Axis. Where smooth, 'tis semi-pellucid, and of a yellow Cast, somewhat deeper than that of the Piped-waxen-
Vein, and glitters slightly not unlike a dusky Selenites. Found on the Shores of Sheppey-Island.

*d. 7. Another, having several Holes and Furrows in it, appearing exactly like the Erosions of Worms in Wood. 'Tis broke at the obtuse End, and striated from the Surface to the Axis. From the Shores near Scarborough, Yorkshire.

*d. 8. A Belemnites very much like that No. 1, only of a darker Colour. 'Tis a little broken in one part, at the obtuse End; and appears to be striated thro' the Crusfts towards the Axis. Found in a Clay-pit near Lambeth.

*d. 9. Another little different from No. 4, but of a fadder Colour. Taken out of a blue Clay in a very high Cliff near Spitton, Yorkshire. They are found plentifully in that Cliff; but many of them are very brittle, and even friable.

*d. 10. Another, very small. This is pellucid, and of a pale Amber Colour. The obtuse end of it is smaller, and comes nearer a point, than in any of the former. 'Tis striated, or rather made up of Fibres tending from the Surface to the Axis, as this sort of Bodies generally are. Found with the precedent in Spitton-Cliff.

*d. 11. Another from the fame Cliff, and of the fame Colour, only somewhat darker, and striated in like manner. The Point of this is like the Point of that *d. 1.

*d. 12. Another, no way different from No. 10, only of a dark Ash-colour, and not pellucid. In a Quarry West of Clipston, half a Mile from the Town, Northamptonshire.

*d. 13. Another, little different from No. 3, only of a fadder Colour. From Clipston-Quarry.

*d. 14. Another large one of a brown Colour; 5 1/4 Inches long, and its Diameter at the obtuse end 1 Inch and 1/10. This is more taper than any of the former, lessening gradually to a sharp point. It has a conical Cavity at the obtuse end 2 1/2 Inches deep; 3/2 of an Inch over at the top; and consequently the Crust, which is single and striated across, is about 1 7/12 of an Inch thick. There are adhering to it a Vermiculus Marinus, and three small Shells of a sort of Bivalve, found frequently in the Stone-pits about Oxford, and seeming to be of the Tree Oyster-kind. There are Vestigia of several more that have stuck to it, but are now broken off and gone. They seem to adhere only to its Surface, and not to be incorporated with the Matter of the Stone. Found in a Stone-pit on Cowley-Common, near Oxford. [There are parts of Balani affixed on the fossil Coralloid, e. 67. infra.]

*d. 15. Another, less, otherwise little different; having likewise one of the same Bivalves, and two or three Vermiculi, sticking to it. Stone-pit, near Emsham, Oxfordshire.

*d. 15+. A Piece of another, with several Shells of the Vermiculi Marini adhering to the Surface of it. Sherburn, Gloucestershire.

*d. 15Θ. Another, with two or three like Vermiculi upon it. Stone-pit near Tanworth, Gloucestershire.
Another having on it five small Vermiculi, twirl'd in such manner as to resemble a fort of small Cochlea Marina. Barrington great Quarry, near Burford, Oxfordshire.

A Belemnites terminating in a pretty blunt Point, semi-pellucid, and somewhat resembling Amber. Bowden, Leices-shire.

Another, with a conical Cavity; and having its Sides which are very thin, striated a-crofs. 'Tis of much the same Colour with the former, but not quite so pellucid. 'Tis but 1 ½ Inch in length. Toward the Cone there is a circular Crack in the Stone, at which the Body is bent a little. Farmington, Gloucef-shire.

Another, larger, being 2 ½ Inches long; and having its Cavity fill'd with a brown Sand-Stone. This is crack'd in several places: much compress'd, and distemper'd; in such manner as that it appears to have sustain'd some great external Force upon it after its first Formation. Tawsworth, Gloucefshire.

A Piece of a Belemnites, crack'd likewise and com-press'd. 'Tis the larger or obtuse part of the Belemnites; its Cavity being fill'd with a brown Sand-Stone. At the bigger end it consists of one thin Crust striated a-crofs; but one side being broken lower down, there appears another like Crust within it. At the other end, where it is broken diametrically a-crofs, it is made up of four Crusts, one within another, and striated transversely, which Crusts are parts of so many concave Cones. From Clipston-Quarry, Northamptonshire.

Another small one from the same Quarry, crack'd compress'd, and distemper'd.

A Belemnites, little different from No. 16. only not quite so pellucid, being of a somewhat more dusky Colour. Found in Spiston-Cliff, with No. 9.

A large Belemnites, near as big as that No. 14. and much of the same Shape. The Apex, or lefser End of it is broken off, where the Stria, arising from the Surface all round, tend, not to the Middle, or Axis of the Body, but to a Line, placed much nearer one side of it, being not above ½ of the Diameter of the Body distant from the Surface on that side. So that the Stria or Fibres there, are not above one third of the length of those tending to that Line from the opposite side. The Crust at the other end is striated a-crofs; and on one side is part of a second Crust, within the other, striated in like manner. The rest of the Cavity is fill'd up with a white diaphanous crystalliz'd Spar. Stowell, Gloucefshire.

Another, broken at each end, and of a flattish form, all the foregoing being round. It appears at the Breaches at both ends to consist of several thin Crusts, one within another, all striated from the Surface towards a Line placed near one side of the Body, as in the lefser end of the former. Found in Clipston-Quarry, Northamptonshire.
Another Piece, broken long-ways, so as to shew the Line above mention'd in No 19, & 20. running the whole length of the Body, placed, not in the middle, but pretty near one side of it. Ibid.

Another, the Cavity of which is fill'd with a grey sort of Sand-Stone, of the same sort with that of the Stratum, in which the Body was originally lodg'd. This is made up of several thin Crufts, striated a-crois, towards the middle of it: On one side it appears as if worn or ground away, so that several of the Crufts are visible one within another for the whole length of the Stone. It happens in two or three places to be broken cross the Grain of the Stria, and appears there flaky, not unlike a sort of Talky Spar. I found in the same Stratum several whose Cavities were fill'd with the same sort of Stone. Birlip-Hill, Gloucestershire.

A Mafs of the Stone of the Stratum above mention'd, with a Piece of a Belemnites in it, broken so as to shew a Cone of the same sort of Stone lodg'd in its Cavity. There is on the same Stone an Imprefs of part of a sort of Bivalve.

Another Mafs of a greyish Stone mix'd with a Spar and having in it numerous Fragments of Sea-shells. There is lodg'd in it a Piece of a Belemnites, whose Cavity is fill'd with the same sort of Stone. From a Stratum of Stone in Sir Ralph Dutton's Home-Park at Sherburn in Gloucestershire. In this Country the Farriers use the Belemnites, finely powder'd, in watery Afections of the Eyes of Horses. The common Pharmacologists recommend it inwardly in Nephritic Cases; and doubtless it has much the same Properties with Spar. Vide infra f. 21. Cl. p. 2.

A Belemnites, broken so as to shew the interior Texture of it. 'Tis striated at the small end towards the Axis of the Stone. Its conical Cavity is fill'd up with a white semi-pellucid Spar. This Spar consists of several Joints, each about \( \frac{1}{3} \) of an Inch in thicknes. On the broader Surface they are concave; on the other convex; so as they fit and joint close to each other, growing still less and less, till they end with a very small one at the Point of the Cone. Norleach, Gloucestershire.

Another, broken so as to shew a like articulated Cone, but of a coarser Spar. Coln-Allins, Gloucestershire.

Five Pieces of other like jointed Cones, taken out of the Cavities of Belemnites. From --- Northamptonshire.

Three other like Pieces; the two larger found in the blue Clay got out of the Canal of the Earl of Montague at Boughton, Northamptonshire: the least from Clipston-Quarry. Mr. Morton.

A Piece of a Belemnites. The conic Cavity, at one end, is fill'd with a grey Talky Spar, at the other with a blueish Stone, in which is infix'd a small Plate of Selenites. Clipston, Northamptonshire.
*d. 30. Another, in which the Cone, filling the conic Cavity, consists of Joints of a yellow Brass-like Pyrites. The Belemnites is of a blackish Colour, and a Conick Shape, and is striated from the Surface towards the Middle. Found lodg'd in the Alum-Stone at Whitby, Yorkshire.

*d. 31. Another out of the Stone too, of the same Shape and Colour, and striated in like manner, but appearing to be made up of several thin Crusts set one within another, and surrounding the Cone. The Joints of the Cone, filling the Cavity, are of a grey Talty Spar, with a slight Admixture of Pyrites.

*d. 32. Six Joints each gradually less than the other. The biggest is very large, being about 1½ Inch in Diameter. They approach an oval Figure, and consist of a hard grey Clay, with some very small shining Sparks, seeming to be of Talc. Both their concave and convex Surfaces are very polite, and in some Places have a shining Armature upon 'em, like that frequently observable on Cornua Ammonis and other Shells that have lain in a vitriolic Earth; and in some Places there appears a little quantity of a Pyrites adhering to them. At Great-Bowden in Leicestershire, Mr. Bland.

*d. 32x. Several Joints, near 20, of much the same Size with the foregoing. Ashley, Northamptonshire. Mr. Sawyer.

*d. 33. A single Joint of much the like Size and Shape with d. 32. sent also by the same Person, Mr. Bland, from the same Place, Bowden. The Clay of it is of a like sort with that of the former; the convex side is polite, and plainly appears to be covered with a thin Crust about ⅓ of an Inch thick. What these Bodies are, is not easy to determine; particularly whether Joints of the Cone contain'd in some very large Belemnites. Mr. Bland informs me he has seen Systems of these of a Conical Figure, and ending in a small Joint or Point; but he never saw any part of a Belemnites adhering to 'em. Be that as it will, they are found elsewhere, filling the Conic Cavities of Belemnites. Conf. *d. 25. supra, &

*d. 39. infra.

*d. 34. A small Belemnites, differing in Shape from any of the former. 'Tis 1½ Inch in Length, and ⅜ of an Inch in Diameter, where thickest. It terminates at one End in a bluntish Point, from whence it gradually swells to about ⅔ part of the Length, thence gradually lessening for ⅓ more, till its Diameter be little more than ⅛ of an Inch, which thicknes it holds to the other End, only swelling a little at the very Extremity where it is hollow, but the Crust very thin. 'Tis a little broken in one part, and appears to be striated toward an Axis, in the same manner as the rest. In the thicker part 'tis of a dark grey Colour; in the thinner of a somewhat lighter. There is a small Chap or Seam running the whole Length of it, but is most conspicuous at the thinner End. This is of that sort which J. Bauhinus in his Treatise de Fonte Bollense, p. 34. calls Belemnites fusi infrar ventre crasifore, in acumen urinæ, definentes. Found in a Stone-Pit at Stuns-
field in Oxfordshire. This Species of Belemnites is also found about Zurich in Switzerland. J. Scheuchzer Spec. Lithogr. Helvet. p. 25.

* d. 34 x. Another of the same kind, found along with * d. 42.

* d. 35. Another, in nothing different from * d. 34. only somewhat less, and found in the same Place. * d. 9. 10. 12. supra are of this Species.

* d. 36. A Piece of a larger of the same sort. In the thickest part 'tis 3/25 of an Inch in Diameter. 'Tis broke about the middle, where it is solid throughout, and striated from the Surface across two thin Crusts to the Axis. From still the same Stone-Pit.

* d. 36 x. Another, dug up in a Tile Clay-Pit, near Thurnham, 3 Miles from Maidstone in Kent.

* d. 37. A Conic Belemnites, near 4 Inches in length. 'Tis rough on one Side, and looks as if grated and worn away; glittering there likewise in small Spangles not unlike one of the Mica. Being broke at the bigger End, it discovers itself to be composed of transverse Fibres. The Conical Cavity is filled partly with a black shining glossy Matter, and partly with a white, much resembling a coarie Spar. In Whitby Alum-Mines, Yorkshire.

* d. 38. Another of much the same Size, Shape and Texture. This is flat at the bigger End, and crack'd as if compress'd by some external Force, though the Paries or Sides are not brought so near together but that some of the Conical Cavity remains, and is filled with the common grey Alum-Mineral. On one part, where broken, the Fibres appear with a shining brassy Gloke, like a Pyrites, but it seems to be only superficial. From the same Mines.

* d. 39. A Piece, broke off from the bigger End of another, of like Size. The Conical Cavity of this is filled with a greyish Matter made up of several Joints as that * d. 25. Both the Concave and Convex Surfaces of the Joints are very smooth and shining. Whitby Alum-Mines.

* d. 40. A Belemnites fusiformis, about an Inch long, somewhat Diaphanous, and of the Colour of Amber. When held up to the light, a Slit or Crack discovers itself passing straight on for the whole length of it. It appears to be composed of many very thin Crusts. Found lodged in a blue Clay in a large Cliff near Spitton in Yorkshire, where there are great Numbers of them. This is very firm and hard, but some of them are so friable that they will crumble between one's Fingers. The Crack above-mentioned is frequent both in this, and the common Belemnites, of which there are Instances in * d. 2. 3. 6. 8. 9. 10. 11. 13. 14. 16. 17. 18. 22. In several of these the Crack is visible from the Axis of the Stone, quite to the Surface. The Seam, or Sulcus, in the Belemnites * d. 43. infra, and the fusiformes * 34 supra. & seq. is wholly external, so far as appears, and quite different from these Cracks.
* d. 41. A Belemnites from Scarborough Shore, worn and fretted by the agitation of the Sea, and having in its Surface several small oblong Cavities, appearing as if corroded by Worms.

* d. 42. A Belemnites, little different from that *d. 14. Out of a Clay-Pit at Hannington in Wiltshire, where they are found in great numbers.

* d. 43. Part of a Belemnites broken to shew the interior Texture of it. The Fibres or Striae tend all to the Axis, about which the Circles appear very plain; and at one End is a brown stony Matter in the middle, which is surrounded with a Circle of white sparly Matter, and that with a Circle of blackish horny Matter. This shews the Manner of the Formation of the Body, and the successive Application of the Constituent Matter: There's a Sear or Sulcus runs down one Side of this Body for the whole Length of it. Silverton, Devonshire. There were several of them; all of this, which is the common sort, conic, and terminating at one End in a Point.

* d. 44. Parts of two more, of the same sort, from the same Place, crack'd and inflected, but cemented at the Cracks, and held together by interposition of a stoney Cement.

* d. 45. Four Belemnites, each an Inch and \( \frac{1}{4} \) in Length, and \( \frac{1}{4} \) of an Inch in Diameter, where thickeft, which is not in the Middle, but rather towards one End. That End terminates in a Point like that of *d. 12.3. and of those *d. 46. which makes me suspect all those to be of the same sort with these, tho' that cannot be ascertain'd, because in all those one End is broken off. But they are of the same Colour and Constitution with these, and were found in the same Places, viz. the Chalk-Pits of Greenhythe and North-fleet, Kent. What is observable in these, is, that they terminate at the opposite End likewise in a Point, little different from that of the other End, only the Body is smooth on that End, and on this 'tis set with Ridges round the Point. As to the interior Constitution of these, they are striated from the Axis to the Center, and are composed of several Crusts, including one another like the other common Belemnites, which appear to be all broken, and we find only Pieces of them. 'Tis not improbable but, when they are whole, they terminate in a Point at each End as these do. I observed Belemnites of this Species in the great Chalk-Pit, on the S.E. of Croydon, Surrey.

* d. 46. Two Belemnites like those *d. 1 & 2. but bigger. Found in a Chalk-Pit near Northfleet, Kent.
Introduction to Class V.

Of the Marine Corals.


C. 1. The Specific Gravity of the several kinds of marine Corals:
   —— of the Antipathes, or Black Coral.
   —— of the red Coral.
   —— of the white Coral.
   —— of the ramose Porites.
   —— of the corallin Astrophytites.
   —— of the corallin Mycetites.

C. 2. Chymical Tryals of the several kinds of marine Corals.


Crystal Spar, is a constant and certain Ingredient of the marine Corals, and there is some small quantity of it in all of them. The different Constitutions, Forms and Colours, of the several kinds of Corals, are owing to the Admixture and Incorporating of various sorts of earthy, stony and mineral Matter, with the Crystallin, in the Formation of them.

There is, besides the mineral, an Admixture of a fibrous Vegetable Matter, more or less, in the Composition of most marine Corals.

Append. The various submarine Shrubs are of a corneous, or ligneous Constitution, consisting chiefly of a fibrous Matter: Otherwise they carry externally somewhat of the Face and Appearance of the Corallin Shrubs. They are also affix'd, like them, to the Stones or other Bodies upon which they grow, by a Pedicle: and have not Roots, as the Shrubs at Land have.

C. 4. A Collation of the marine Corals, with the several kinds of Spar.

The Constituent Matter of Coral and of Spar compared.
The interior Texture of Coral and Spar compared.
The Colour of the several sorts of Coral and Spar compared.

Part 2. Of the Forms of the marine Corals, and a Collation of them with the various Forms of Spar, and of some other Minerals.

C. 1. Of the Corallin and Sparry Astrophytites.

C. 2. Of the Corallin, Sparry and Mineral Mycetites, e. 47. 48.

C. 3. The fistulose Sparry Stalactites compared with the Corallin Poriti.

Append. Of the native Iron Stalactites; and the Brush-Iron-Ore: o. 22. & seq. Of the florid Iron-Ore, o. 28. 87. & seq.
C. 4. The florid and ramose Corals compared with the florid and ramose Spurs that are form'd by the meer Action of the Water in the perpendicular Fissures of the Strata. See the Spurs, N° s. 44, 68, 69.* 83.

APPEND. Of the Capillary, and Arborefect Silver, and the Arborefect-Iron. o. 87. found in the Metallic Veins and Fissures.

C. 5. Of a very elegant Spar found in the perpendicular Fissures of the Lead-Mines of Arkendale, that very nearly approaches the Shape of Erica or Heath.

Part 3. Of the Manner and Posture in which the Marine Corals grow, and are affix'd to the Rocks.

C. 1. Of those that are found erect.

C. 2. Of those that are pretended horizontally.

C. 3. Of those that are found hanging down from the Jets of the Rocks, like the Sparry Stalactite, in which manner the far greatest Part of Corals are found. Conf. Rairj Hist. Plant. Tom. 1. p. 61. d. and Mr. Willoughby's Voyage thorough Spain. p. 466.

Part 4. Instances of several other Bodies that resemble some kinds of Corals in Figure; and may serve to illustrate and clear up the Natural History of them.


C. 2. Of the Stellar Shootings upon the Surface of the Regulus of Antimony, as it becomes cool, after Fusion.

C. 3. Of the Ramose and Stellar Sketches upon the Mocho-Stones.

C. 4. Of the Dendrites, or Delineations of Trees, Shrubs, and ramose Figures, made by mineral Streams, on Flints, Marble, Stone, Slate, and various other Fossils. Vide Maniff. i. infr.

C. 5. Of the ramose Concretions of the volatile Salts, observable upon the Glas of the Receiver, whilst the Spirits of Vipers, Hart's-horn, and other like Spirits are drawn; especially if the Operation be gentle and slow.

C. 6. Of the fuliginous Matter form'd, by the Drift of the Air, into the Shape of a Species of marine Lichen, in Creeks of Chimneys, Stoves, Forges and Furnaces, where there are Fires kept for a considerablc Time, and much Fuel spent.


C. 7. Of Snow affix'd, in ramose Figures, on Trees and other stable Bodies, by means of the Wind, or Drift of the Air.


C. 11. Of the Ramose Figures form'd by a sudden Parting of the Stones used in grinding and preparing of Crabs-Eyes, Pearl, Coral, and other like Bodies for Medical Use.

C. 12. Of the Ramose Figures form'd by the terrestrial Matter left, upon the Evaporation of a small Quantity of muddy Water diffused, very thin, upon any polite Surface.

PART 5. Of the Origin and Formation of the Marine Corals.


The Earth is the Promptuary of the Corallin Matter, it being originally derived from the Rocks, the Cliffs, the Shores and Shallows.*

It is distributed and lodged in the Earth with great uncertainty, some Shores abounding with it, and others having little or none.

The Corallin Matter is likewise very various, that repolished in one Cliff being frequently unlike that of another.

Nay, that in the same Cliff is sometimes very various; and that which is lodg'd in the upper Parts, differ's in Kind, in Constitution, in Colour, and in Mixtures, from that which is below.

C. 2. Of the Agent that educes forth the Corallin Matter, distributes and disposes of it.

This is the Water of the Sea which washes and drains it out of its Fund, affumes it up into itself, conveys it to the Place of its Formation, and deposits it there.

At such time as the Sea is agitated, and in Emotion, it takes up into itself Terrestrial Matter of all kinds, and in particular the Corallin Matter, depositing and letting it fall again, as it becomes more quiet and calm.

The Promontories and Jets of the Shores being chiefly exposed to the Action of the Sea and Storms, the greater Part of the Corallin Matter is, by that means, beaten off from them, and is again precipitated, and the Corals form'd out of it in Creeks, Bays, the Bottoms of the deeper Seas, and such other Parts as are quiet, still, and shelter'd from those Emotions.

In the greater and more violent Storms, the Sea being forced and cast up to the higher Parts of the Rocks and Cliffs,

* The Bottom of the Sea, at greater Depths, being not affected, or Earthy Matter raised from it, in the most boisterous Storms. Vide Nat. Hist. of the Earth, 2d Edit. p. 25. 26.
...draws thence frequently Matter very different from that which is repofited in the lower Parts of them; which is only what it was wont to draw forth during Tides, and the lesser and more common Agitations.

The Number and the Bigness of the Corals on any Shores, is in Proportion to the Quantity of the Corallin Matter thereabouts, and to the Intenseness and Agitations of the Seas.

C. 3. Of the Modulation and Composure of the various Corallin Bodies.

When the Sea-Water, charg'd and impregnated with the Corallin Particles, becomes, after Storms and Emotions, again calm and quiet, it lets fall those Particles, depositing and affixing them upon the Rocks, Stones, Shells, Sea-Shrubs, the Corals before extant, and such other stable Bodies that happen to be near and present.

This it has done in all Ages, does at this Day, and will continue to do so as long as the Sea shall continue to work and beat off Matter from the Cliffs and Shores, to remove and transpose it from Place to Place.

The Coral found affix'd and growing upon wreck'd Ships, loft Anchors, and various other artificial Bodies, that are daily dragg'd up out of the Sea, affords a Demonstration that Coral continues to be form'd to this Day, and shews likewise in what Quantity and Proportion it is produced.

Where the Corallin Matter, in the same Cliff, is chiefly uniform and of the same kind, the Corals form'd out of it are so too. Where 'tis various, they vary as much, and there are Bodies of different Tenor and Complexion, found together in the same place. Nay where it so happens that the Matter repofited in the upper Parts of the Cliffs differs from that below, and is not drawn forth commonly as that is, but only in the greater Storms, when the Sea is cast up to those Heights, the Corallin Bodies form'd in those Parts are variegated. Sometimes a distinct Sprig of Red is form'd on a Shrub of white Coral, or a Crust of Red cast upon a Sprig of White, with several other like Varieties.

The Corallin Matter is found either, 1°, only simply precipitated in likeness of a Sediment; or 2°, concreted upon Stones, Shells, and Sea-Shrubs, after the manner of an Incrustation; or else 3°, it is form'd into regular and observable Figures, such as are the Corallin Shrubs, the Pori, Atrotae, and Mycetitae.

The first sort nearly approaches the Plates of Spar, found concreted upon the Stones of the Sides of the Perpendicular Fissures of the Strata. vid. Class vi. Part iii. § 1.

The second sort, or the Corallin Incrustations are, in all respects, like the Incrustations of some sorts of Spar upon Bodies in the Sources of Springs and Rivulets, there being none the least difference betwixt them either in the Nature of the Matter of each, the Colour of it, or in its Texture and Disposition. Vid. Cl. vi. Part 1.
As these two sorts of Coral agree exactly with the plated and incrusted Spar in Constitution, so do they likewise in the Process of their Formation. Vid. Cl. vi.

The Corals of the third Rank are generally composed of a Matter much finer than that of the two former. The Parts are also more close, firm and compact: nor are these of a Constitution near so simple as those are, but shew throughout something more regular and observable, as well in their interior Texture as in their external Figure.

As has been noted of the two former, so there are Spurs that both in Texture and Figure, very nearly resemble the Corals of this Rank: and not only Spurs, but several other Mineral and Metallic Bodies.

Of this, to pass by all the rest, the Heath-like Spar and the Arboresecent Iron-Ore, o. 87. and the Arboresecent Silver are illustrious Instances. These carry not only a Resemblance of some of the Ramose Corals, but have something in their Frame and Shape, as curious and artful as any of them all.

So likewise the flinty and sparry Astroite are, in all respects, as remarkable and extraordinary as the marine.

And there are Pyrites that agree exactly both in their outward Shape, and their interior Constitution, with the Corallin Mycetita. Vid. o. 47. 48. infra.

Other Pyrites there are of the very same Figure, Texture and Compages with the Astroites corallinus undulatus of P. Boccone. Recherches & Obs. Nat. p. 141. which is indeed the most admirable of any in all the whole Tribe of Marine Corals. Vid. b. 20. 32. 41.

As these Bodies, both Fossil and Marine, agree in their Texture and Composition, as well internal as external; so do they likewise in the whole Series, Process and Method of their Formation.

The constituent Particles of both are originally derived from the Earth, by the Motion of Water; and are by little and little precipitated again, upon the Cessation of that Motion.

And for the Structure of both the Mineral and Corallin Bodies, 'tis merely the Result, partly of the Figure and Disposition * of the Particles, of which the several sorts of those Bodies are composed: and partly of the Motion and Modulation of the Parts of the Water, wherein the separate Particles were sustained.

* Which likewise is the Case of the Ramose, Fuliginous, Snowy and Prunose Bodies; with this only Difference, that the Air or Atmosphere was the Vehicle of the separate Corpuscles of those, as the Water was of those.
The suliginous lacetous Matter, taken notice of by that diligent and ingenious Botanist P. Boccone, in the Coral Filings upon the Coast of Italy, was only a Collection of the Corallin Particles thus sustained in the Sea Water, hovering about and applying it self to the Corallin Shrubs and Pori, for their Growth and Enlargement. The Acrimony, he observed in tasting of it, arose from an Admixture of the Sea-Salt; which, in Bodies taken forth of the Sea, is not to be avoided. Indeed some Trials I have made, have taught me that 'tis not excluded even from the Corallin Bodies themselves, there being some admixture of it incorporated with the Corallin Matter in their Constitution.

This is what some Writers, that are very fanciful, but not over happy in their Fancies and Opinions, call the Seed of Coral. And it must be allow'd in favour of their Notion, that this is the very Matter out of which the Corals are raised and composed, how little Analogy ever it may carry to Seed.

And this likewise was, I suppose, what run in the Head of a late Writer of Natural History, (who 'tis agreed on all hands, is not wont to have the most lucky Hits of any Man living, in the Conduct of his Thoughts) when he diverted himself so much with the Speculation of the Seed of Coral; and, as for more sureness he repeats it, the Sperme of Coral, which he imagined he had so often seen. Only he quite mistook the matter, and unfortunately lit upon what was as foreign to it as well could be; what has nothing of a Corallin Nature in it, nor any the least Concern in the Formation of Coral. For that pellucid gelatinous Substance, which he pitches upon with so great Reliance and Positiency, is chiefly of Animal Constitution, and no other than an Excrement cast off from the numerous Shoals of Fish that inhabit the Main. This is flung upon some Coasts in far greater Plenty than others by the Drift and Bearing in of the Sea upon them.


As others do the separate loose Metallic and Mineral Corpuscles, brought by the Water into the Veins, for the Compilation of the Ore there, the Seeds of Metals and Minerals. See Nat. Hist. of the Earth, 2d Edit. p. 216. 217.

As also what Dr. Tournefort has noted about this Substance. Mem. de l'Acad. des Sciences. 1700. p. 29. 35.

For such it is, and not mucilaginous, as he styles it.


As I remember one Sort of it is called Sea-blubber in some parts of England.
them. 'Tis indeed true there are sometimes found Corallin Particles implicated in this; but that is merely accidental, and Fragments of Shells, Sand, Ouze, and the other Recrements of the Sea, are much more commonly observed to be intangled in it. At such time as the Sea is in any unusual Emotion, this floats; when that is calm, it sinks to the Bottom, and alights upon the Shells, Flints, and all other Bodies there promiscuously. Amongst the rest, if there be Coral, it frequently happens to settle down upon that, and being of a Disposition very flexible, it readily plies and conforms itself to the Surface of the Coral, and so receives and assumes the Figure of it. This was what chiefly amused and misled this Writer; which yet is no more than what it does indifferently to all the Bodies it chances to light upon, and he might, with equal Reaon, have concluded that it was the Seed of the Shells, the Flints, and the other Bodies that 'tis much more commonly found shaped to, and lodg'd upon, as of the Coral. But nothing more need be offer'd to evince upon how flight a Foundation this Notion stands, than that 'tis certain Matter of Fact that there are Corals found in great Plenty and Variety in Places, where little or none of this gelatinous Substance, which he has pitch'd upon for the Origin and Rudiments of all Corals, ever appears; and it occurs frequently and in abundance, in Seas where not so much as one single Sprig of Coral is any where to be met with.

Append. 1. The Effects of great Storms upon Coral.

Those Creeks, Bays, and other Parts of the Sea where Corals are form'd, tho' generally calm, and free from Disturbance, at some Times, and particularly when Hurricanes happen, and Storms that are more than usually Violent, are put into Emotions so great as to break and tear up the Coral again, and to dash and beat to pieces the Bodies that were form'd in the Calms and the Intervals of those Commotions.

Append. 2. Of the Coral Fishery.

The chief Place for the Coral-Fishery is upon the Coasts of Sar-dinia and Corsica: the next upon the North Coast of Sicily: then upon the Coasts of Barbary, near Tunis: towards the Isle of Tabarca; upon the Coasts of Catalonia, chiefly at Catache, where the Coral is of the deepest Red, and so, the finest, of any Part of the World, but 'tis small, and frequently eroded and perforated by Worms. 'Tis also found under Monte Nero, and indeed upon the whole Coast near Leghorn; tho' 'tis there also small, and therefore not so much valued. They drag up Black-Coral, and Fistularia purp. Fer. Imperati, sometimes, with the Red; and also the White that is firm and polite: and of that which the Pescadori call Ravano, which is the white Porus of several Species, which they fling away.
A Pound of red Coral being powder'd and distill'd, per se, in Are-nda, I found betwixt 20 and 30 gr. of a fetid Oil, of a deep red Colour in the Neck of the Retort. Besides the Oil, there came over into the Receiver, a Phlegma, attended with a volatile Acid. This Acid, by Digestion, was reduc'd to a volatile Salt, differing no other ways from that of Amber, than in its wanting of the slight bituminous Flavour which that has. The Oil, like other fetid Oils, dissolv'd in Spirit of Wine. It approach'd the Nature of the vegetable Oyls, but the most nearly that of Tartar, in Smell, Consistence, and all other Respects. This shews there is something of a Vegetable Nature in red Coral; but probably not in such Proportion to the crystallin or stoney, as to have held that together, and secur'd it from Dissolution at the Time of the Deluge, when all other stoney and mineral Bodies were dissolv'd.

**CLASS V.**

**Fossil Corals, and Coralloid Bodies.**

*The Classical Distribution of these Bodies.*

**PART 1.** Coralloid Bodies that are ramose or branch'd.

Sect. 1. The branch'd Coralloid Bodies that have the Surface smooth.

2. Those that have the Surface reticulated.

3. Those that have the Surface starr'd.

4. Those that have Striae passing from the Surface to the Axis.

**PART 2.** Coralloid Bodies that are of a cylindric Shape.

Sect. 1. The Cylindric Coralloid Bodies that are composed of Plates, set lengthways of the Body, and passing from the Surface to the Axis of it.

2. Those that are tubular, but intercepted at certain Intervals by Diaphragms, or transverse Plates.

**PART 3.** Coralloid Bodies oblong, and in Shape of Columns with five Sides.

Sect. 1. The Pentaedrous Columnar Coralloid Bodies that are composed of Plates set lengthways of the Body, and passing from the Surface to the Axis of it.

2. Those that are intercepted, at certain Intervals, by Diaphragms, or transverse Plates.
Part 4. Mycetites, or Coralloid Bodies in Shape of Mushrooms.

Sect. 1. The Mycetites that are of a Conic Figure.
2. The Mycetites that are of a Discoid or flat Figure.

Part 5. The Astroites, or starred Coralloid Bodies.

Sect. 1. The Astroites, that have the Stars prominent, or rais'd.
2. Those that have the Stars delineated in Plano.
3. Those that have the Stars depres'd.
4. Those that are perforated or hollow'd.

Extract.

C. 1. The Names given to some of the Fossil Corals.
Shrubby or branched Corals, some white and others grey.
Corallium nigrum, S. Antipathes. J. B. C. P. e. 2.
Porus Coralloides, very beautiful, perfect, and as to its Texture little different from the marine; lodg'd in Black Marble, x b. 62.

Tubularia Ferr. Imperati. e. 4.
Steleschites. e. 13.
Funct Lapidei. e. 22 x. [These are found in an erect Posture: as also the Hillsfield Cylindrick Coralloides. e. 17. e. 18.

Mycetites Coralloides, or Mushroom-Stones. e. 47. & seq. e. 54. 60. 62.
Porphites. e. 68.
Honey-Comb Stone. e. 112.

Astroites. e. 84. & seq. 97.

Astroites coralloides undulatus, or the Brain-Stone. e. 87.

C. 2. The several Places where the Coralloid Bodies are found.

Greenwich, e. 80. 81.
Croydon, Surrey. e. 12 x.
Purfleet. e. 47. & seq.
Norfleet. e. 65. 67.
Shepey Island. e. 47. 48.
Near Oxford. e. 56. 57. 61. 84. & seq. 107. 110. 114.
Oxfordshire, &c. e. 68.

Bullington-Green, Oxford. e. 117.
Shotover-Hill near Oxford. e. 85. 105. 106.

Abbington, Berkshire. e. 116.
Harborough, Leicestershire. e. 12.
From . . . Wiltshire. e. 41. 42.
Broadwell, Gloucestershire. e. 74.
Sheburn, Gloucestershire. e. 14. 83. 96. 88. 104.

Yanworth-Fields, Gloucestershire. e. 86. 98.
Wheatland's-Mill, Gloucestershire. e. 54. 87. 91.

Stowell, Gloucestershire. e. 97.
Norleach, Gloucestershire. e. 92.
Wakerly, Northamptonshire. e. 10.
Artleborrow, Northamptonshire. e. 93, 94, 95.
The Earl of Dysert’s Yard.
Northamptonshire. e. 100, & seq.
Near Bristol. e. 112.
St. Vincent’s Rock. e. 62, 63, 64.
Wales. p. 42. x b. 62.
Landikno, Caernarvonshire. e. 16.
Brecknockshire. e. 20 x.
Whiston. e. 74. 75. 109.
Shores near Skegness, Lincolnshire. e. 22, 26, 27, 32, 34, 36, & seq.
Dudley, Staffordshire, e. 5, & seq. 15, 44, 45, 46, 55, 60, 82.
Shores near Sunderland. e. 3, 23, 24, 31.
Scarborough, Yorkshire. e. 28, 66, 108.
Ousthorne, Yorkshire. e. 25, 35.
Paul, Yorkshire. e. 29.
Near Leeds, Yorkshire. e. 40.
Hilden, Yorkshire. e. 89.
Sedberg, Yorkshire. e. 4.
Hacketts-Head, Yorkshire. e. 19.
Leonard’s Castle-Abbey, Cumberland. e. 113.
Betwixt Carlisle and Cockermouth. e. 22 x. 22 +.
How-Lees, Cumberland. e. 51, 52, 53.
Torpeno, Cumberland. e. 13, 50.
Helsfield, Cumberland. e. 17, 18.
Kendal, Westmorland. e. 20, 50.
Potgill, Westmorland. e. 34 x.
Tripland, Westmorland. e. 30.
Eynsham, Oxfordshire. e. 1, 69.
Windrush, Gloucestershire. e. 2.
Mynehead, Somersetshire. e. 21.
Shotover-Hill. e. 58.
Aulsheworth, Gloucestershire. e. 71, 103.
Risington, Oxfordshire. e. 72, 73.
Coln St. Allens, Gloucestershire. e. 97.
Farmington, Gloucestershire. e. 99.

C. 3. The various Sorts of terrestrial Matter, in which the Coraloid Bodies are found reposited.

In a blue Clay, e. 58, 59.
In Chalk, e. 47, & seq. 65, 67, 80, 81.
In Gravel, e. 13.
In a whitish Stone, e. 10.
In a brown Sand-Stone, e. 17, 18, 30, 40, 83, 86.
In a brown Stone of a finer Grain, e. 21, 23, 26, 31, 36, 37.
In a pale brown Stone. e. 19.

§ 1. The Specific Gravity of the several Kinds of Fossil Corals.

--- of the Antipathes, or black Coral,  
--- of the red Coral,  
--- of the white Coral,  
--- of the ramose Porus,  
--- of the coralloid Astroides,  
--- of the coralloid Mycetites.

§ 2. Chymical Trials of the several Kinds of Fossil Corals.

§ 3. Of the constituent Matter of the Fossil Corals.

As in the Marine, so likewise in the Fossil Corals, there is constantly Crystal; but very much less in the former than in the latter. e. 93.

With the Crystal also are incorporated various sorts of Earthy, Stony, and Mineral Matter; to which the Fossil Corals owe the Difference in their Constitutions, Forms, and Colours.

The fossil Corals never have in them any thing of fibrous, or vegetable Nature; which most of the marine Corals have: tho' many of them very little. Confer. Append. 3. to the Extract of the Account of the marine Corals.

And the common constituent terrestrial Matter, incorporated with the crystalline in the fossil Corals, is different from that in the marine. Vid. e. 69.93.97.105. & seq.

§ 4. Many of the fossil Corals consist of the Matter of the Flint, or Agat. e. 41. & seq.

§ 5. Others of them consist of the Matter of the Pyrites. e. 47; 48. and b. 4. 20. 41.

C. 5. Of the Origin and Formation of the Fossil Corals.

They are found, reposited in the Strata of Earth, Chalk, Stone, Marble, and the like, (Conf. C. 3. supra) along with the Pellicles of Ova of Fishes, and Sea-shells of all kinds. e. 10. & seq. 84.

Consequently they must have been form'd before ever the Strata were compil'd, or had attain'd their Solidity.

They are apparently all referable to the Nodule-kind; and were form'd at the Deluge, as all other + Nodules were. e. 1. 86.

At that time all terrestrial Bodies, and in particular Crystal, Spar, and Corals, were in a State of Solution; and the Principles, or constituent Particles of them, sustain'd in the watry Mafs. e. i.

After some time, those Particles, uniting and combining into Mafes, compos'd the Metallic, Mineral, Sparry, and Coralloid Nodules.

And, there being sustain'd, in the same Fluid, Teeth and Bones of Fishes, Shells, and other marine Bodies of all kinds, the metallic and mineral Particles frequently affix'd and concreted upon them. Accordingly there are commonly found Flint, Ores of Metals, and Minerals, adhering to the fossil Shells; in like manner there are found of the various kinds of fossil Corals actually adhering to the Shells dug up at Land; and some of them, particularly the Mycetita, have Pedicles, and are affix'd to Shells in much the same manner that those found at Sea usually are. e. 1. 10. 11.

As sometimes Bodies of different kinds join'd in the same Nodule: and in particular the Pyrites, Sparry, and other Mineral Matter, grew to Flint; so likewise there are Instances of the fossil Corals united to Flints.

In Conclusion, the Nodules of all kinds, and particularly the Coralloids, settling down, with the earthy, chalky, stoney, and other terrestrial Matter, were repos'd in the Strata which that Matter compos'd ; in which they are at this day found repos'd. e. 1.

C. 6. Of the Modulation, and Composure of the various fossil Corals.

As there is an agreement of many of the fossil Corals with the marine, in Texture, and in Form; and both were once in the same condition, the Particles separate, and sustain'd in Water, those at the Deluge, and these in the Sea; so each owe their Formation to the same Cause, the Motion and Action of the Water, and the Figure and Disposition of the Particles that constitute them.

Of the Formation of the star'd Flints. e. 43. x.

Appendix I. Concerning the Reason why the Sea-shells, and other animal and vegetable Bodies then in being, were not dissolv'd, at the Deluge, as well as the Corals, and all Fossils.

From what has been deliver'd, above, 'tis sufficiently clear that the marine, as well as the fossil Corals, had in them something of
Honey and mineral Constitution; that, for that reason, the marine Corals were dissolv’d, as well as the terrestial Bodies, of all sorts, at the Deluge: and that the fossil Corals were finally compos’d out of the coraline, flinty, sparry, and other mineral Matter into dissolv’d. It has been also noted, that some of the fossil Corals affix’d to, and concreted upon Sea-shells, that were then sustain’d in the Water along with them. And it being a thing very remarkable that all terrestial Bodies whatsoever, even the most firm and solid, should undergo such Dissolution, and yet the animal and vegetable Bodies, some of which are very tender, be exempted, and remain all the while intire thorough the whole Process of that great Revolution; it may not be unseasonable to offer something touching the Reason of it. Not that I shall now go about to set forth all the Particulars of this Affair. To do that, would be tedious; and indeed not needful. So that I shall reserve the rest to its proper Place; and here restrain myself to as little a Compass as may be, without being obscure.

The Earth is the great Fund out of which Bodies of all sorts arise, Animal, Vegetable, and Mineral. But Things lie in that Fund with so much Confusion, Mixture, and Uncertainty, that there are not perhaps many Things derived thence that are wholly pure, homogeneous, and unmix’d. Infomuch that several animal and vegetable Substances have in them an Allay of mineral Matter; as there are mineral Masses that contain some share of a vegetable Matter. Those Corpuscles that are truly of animal or of vegetable Nature, differ from those which constitute the mineral Solids, in several very considerable Respects. 1. They are lighter, and of less specific Gravity, than those of Minerals are. 2. They are of different Figure; the animal and vegetable Corpuscles being extended, oblong, and frequently ramose; whereas those of Minerals are compact, and more closely collected about their Center. 3. They are of different Constitution. These are flexible; but

‡ The Animal Corpuscles are homogeneous, and of like nature with those in Vegetables; from which they were indeed all originally derived. Vid. Nat. Hist. of the Earth, 2d Edit. p. 127. & 227. & seq.

‡ For this Enquiry is only relating to the Dissolution of the solid Fossils; such as Stones, Ores, and the like.

|| I speak here of the Corpuscles that constitute them, and not the Parts themselves. Some of them, e. gr. the Bones, are inflexible. Which does not arise from the Inflexibility of the Corpuscles that compose them; but from the Greatness of their Number, and the Firmness and Tightness of their Union and Combination. This is evident from the Bones of Animals that are young and growing; which are tender, and flexible; their constituent Particles being then fewer in number, and less closely united. The same likewise is the Case of Trees.
but those generally rigid. 4. They differ in the Manner of their Union and Composition. The Corpuscles of Fossils are only contiguous to each other, and merely simply apply’d Surface to Surface; whereas those of animal and vegetable Bodies are complicated, tied, and interwoven with one another. 5. They differ in the Cause of their Cohesion. This, in animal and vegetable Bodies, proceeds from themselves; from the Figures of the Parts of the Corpuscles, and their Twistings and Complications with one another. Whereas the Corpuscles of the fossil Solids are perfectly passive; and owe their Cohesion entirely to the Compression of the external Ambient, wherein they exist; which Compression arises merely from its Gravity. Now from several Phenomena, at this day extant in the Earth, it appears that the Gravity of all Bodies, solid and fluid, in and about the terraqueous Globe, at the universal Deluge, for some time, ceased, and deserted them.

Things therefore standing thus, the Consequences of them are very evident, and obvious. Upon the Cessation of the Gravity of

Trees; which, however firm they may become when grown, were all once very yielding and pliable. Besides that the Parts of either, being split, and thinned, are by that means render’d pliant and flexible. Not that mineral Matter, as has been already mention’d, is wholly excluded the Compaiges of Bones, Shells, and some sorts of Vegetables. And this may contribute something to the Increase of both their Firmness, and their Gravity. In like manner there are Fossils, as also Corals, that have a fibrous vegetable Matter incorporated with the mineral. Some indeed of the Corals, and particularly of the red, have so much, that ’twould not have been strange had they been by it secured against the Dissolution here treated of.

† So generally, that I know of only one to be excepted; which is Talc: for this seems to be composed of Corpuscles that are flexible.

Vide Clas. 4. Preface.

‡ Not only the Air, and groffer, but even the finest and subtilest Parts, and indeed the whole Fluid of the Atmosphere.

|| Vide Nat. Hist. of the Earth, passim.

‡ Perhaps not entirely. For then, upon the Earth’s Revolution on its Axis, all terrestrial Bodies would have been flung off, from the said Axis; and consequently the Parts of the Globe, both the Earthy, and the Aqueous, have been dissipated. So that those Parts and Bodies retain’d still just as much of their Gravity, as might serve for a Counter-Balance to the Force of that Revolution, to prevent their Dissipation; but no more. I mean in case there was then such a Revolution; which I am the more cautious of asserting, because Moses seems to imply that both the diurnal and annual Motion of the Earth was suspended for the Time; and that there was then no more a Succession of Day and Night, than there was of the Seasons, Summer and Winter. See Gen. viii. 21. 22. Conf. Jerem. xxxiii. 20. 27.
the Ambient, to which the Fossils owe the Cohesion of their Parts; their Solidity would instantly cease, and the Corpuscles fall all asunder. But that would not in the least affect the animal and vegetable Bodies; the Cohesion of whose Corpuscles arose from a Cause so very different, as is the twirling, weaving, and combination of those Corpuscles amongst themselves; which would not be in the least touch'd or disturb'd by that means. So that they must remain as firm and intire, as if no such thing had ever happen'd.

This may be illustrated by the Example of the Magdeburg Experiment. In which two Pieces of Marble, having their Surface exactly plane, polite, and apply'd to each other in such manner, as, so far as they are contiguous, to intercept the Air, do cohere firmly together as one; the Gravity, of the Air without, pressing and holding them together. These two Pieces of Marble, thus conjoin'd, being put into a Receiver, and the Air exhausted, immediately disunite, and fall asunder. But if there were put into the Receiver at the same time, two Pieces of Cord, that were firmly complicated and tied into a Knot; 'tis plain the drawing out the Air would contribute nothing to the loosing of that Knot, or untying the two Cords.

And this was the very Case of the animal and vegetable, and of the fossil Bodies, during the time that the Pressure of the Ambient was taken from off them at the Deluge; and lets us clearly into the Reason why these were not dissolved as well as the Fossils.

The Coralloid, and the other Nodules, form'd after that Dissolution † indeed, but during the Suspension and Relaxation of the Cause of Gravity, must have been at first soft; but as soon as the total Gravity was again restor'd to Bodies, they became solid, and settled down; and, along with the Shells and other extraneous Bodies, the Earth, Sand, and the like, compiled the Strata in which they are at this day found.

In this Catalogue there are several Instances of Nodules, and particularly of Pebbles and Flints, that appear to have been so soft as to have given way to external Force and Pressure since they were form'd. So likewise for the Bodies of this Class, the fossil Corals, some of them appear to have been compressed, others inflected, and crack'd, in such manner as could not have happen'd but before they had attain'd their present Hardness. e. 15. 22 †. 40. 49. 50. 67.

These Nodules, being form'd in Water, must have, in course, watery Particles disseminated thro' their Pores and Interstices. So that, during the abode of those Particles in them, the Bodies could not attain their full Solidity. But, as they successively withdrew and gave way, their Corpuscles approaching nearer to each other,

† Vide Nat. Hist. of the Earth, Part iv. Conf. 2.
the Nodules became more solid, close, and firm; or at least the Parts of them: for it sometimes so happen’d, that by this Action, they were crack’d and divided into Parts. Of this the Ludus Helmontij affords us an egregious Proof, (Vide Preface to the Account of that Body, supra.) Nay, by the like Action the Strata of Coal, Stone, and Marble, were frequently crack’d in like manner. But tho’, in tract of time, part of the Water, wherewith they were saturated, thus quits them, yet the whole never drains forth, nor do they arrive at their utmost Solidity till they are brought up, out of the Bowels of the Earth, into the Air. This is evident in Stone, and in Marble, which are softer, and may be cut and work’d with much greater ease, when first parted from their Strata, than afterwards when they are rais’d to the Surface, and have lain there till wholly freed from the Humidity wherewith they were charg’d whilst below.

CLASSIS V.

Corpora Coralloidea, & hisce affiniae.

Pars I.

Coralloidea ramosa:

Sect. 1. Coralloidea ramosa, superficie laevi.
2. Corall. ram. superficie reticulata.
3. Corall. ram. superficie stellata.
4. Corall. ram. à superficie ad Medullam striata, seu lineata.

Pars II.

Coralloidea Cylindriformia.

Sect. 1. Coralloidea Cylindracea, è lamellis composita secundum longitudinem à Superficie ad Axin tendentibus.
2. Coralloidea tubulosa crebris lamellis transversis intercepta.

Pars III.

Coralloidea Columnaria pentaedra.

Sect. 1. Coralloidea oblonga pentaedra, laminis à Superficie ad Axin tendentibus.
2. Coralloidea oblonga pentaedra septis transversis distincta.
Pars IV.

Mycetitæ Coralloides.

Sect. I. Mycetitæ Conoides, sive Calyciformes.
2. Mycet. forma compresiæ, sive Discoides.

Pars V.

Astroite Coralloides.

Sect. I. Astroite Stellis prominulis.
3. Astfr. Stellis depressis.
4. Astfr. Foraminosi, five à Superficie ad interiora Corporum excavati.

CLASSIS V.

Corpora Coralloidea, & hisce affiniae.

Pars I.

Coralloidea ramosa.

Sectio I.

Corpora Coralloidea ramosa Superficie levii.

e. i. Five small Branches of Coral, of a grey Colour; and one white. Found in a Quarry not far from Ensign-Ferry, Oxfordshire. One of them has the Shell of a *Vermiculus Marinus* adhering to it: 'Tis very common to see Flint and other mineral Matter affixed and adhering to fossil Shells. This apply'd itself to them during the time that the said Shells, and the dissolv'd mineral Matter, were suspended together in the Water at the Deluge. Vide Nat.Hist. of the Earth, Partly. The Cafe of this Coralloid Matter was the same. Nor can I see any reason why real Coral, not different from that now observ'd at Sea, may not be found: and adhering also in like manner to Shells. There are below some Bodies that I take to be Instances and Proofs of it, and really of the same sort. Vide e. l 2. 33. 49. 55. The true marine Coral is indeed a Choney Substance; and of mineral Nature and Origin. The constituent Matter of it is beat off from the Rocks and Cliffs, where the Agitation of the Sea is great; born thence, precipitated, and affixed to Rocks, Stones, Shells, or other Things, where the Water is more still and calm. As 'tis of the same Constitution, so it owes its Solidity, and the Cohesion of its Parts, to the
the same Cause that Stones and other Minerals do: and conse-
sequently must have undergone the same common Fate, and been
dissolved, as well as they, at the Deluge. And that Coralline Mat-
ter, so dissolved, might as well concrete again, as that Matter
which constituted the mineral Nodules, particularly those of this
Cliffs, and Flint, Pyrite, &c. Nor can there reasonably be any
doubt, but there was, in some parts of the Fluid, a Collection of
homogeneous Coralline Matter: as from the Nodules we learn
there was of Talty, Crystalline, and other Mineral Matter. Now,
out of that, Coral might as well be form'd, as Talty, Crystalline,
and other Mineral Nodules out of those dissolved Minerals.

e. 2. A Piece of a Coralloid Body, black, both on the Outside,
and in the Body, where broken. 'Tis not much above half an
Inch long, thicker than any of the precedent, a little bent, and
appears to be part of a Branch broken off from the rest. Out
of a Quarry near Windruf, Gloucefhire.

e. 3. A great Number of Coralline Bodies, lodg'd pretty close
in a grey Stone. They are generally near as thick as a Wheat-
Straw: and some of them are branch'd, but whether all, is not
so easy to discern. In a few there are Branches from one to an-
other, which, meeting, join them together. Found on the Shore
near Sunderland, in the Bishoprick of Durham.

e. 4. A Fasliculus of several Pieces of a grey Coral, lying gene-
 rally parallel, and held together by means of several small Bran-
ches passing from one to another, and uniting where they meet.
The whole somewhat resembles the Tubulavia purpurea of Fer-
rante Imperati: and the Stems of this are of the thickness that
those of that commonly are. Some of them are tubular, others
solid. Found near Sedberg, in Yorkshire.

/ PARTIS I. SECTIO II.
Corpora Coralloidea ramosa superficie reticulata.

e. 5. A pretty thick Piece of grey Coral, having the Vestigia
of three Branches rising out of it. It is finely cover'd with a sort
of Net-work all over its Surface, the Mashes small, and round.
Found in a Stratum of Rubble-Stone, lying over the blue Lime-
Stone, in the great Pits near Dudley, Staffordshire.

e. 6. Another smaller, otherwise little different, from the same
Place. Being broken, it appears to consist of a grey Spar. This
is only a Piece broken off a Branch: as also e. 8. infra.

e. 7. Another from the same Place. The Mashes of the Reticu-
lum in this are smaller than in either of the former. The Trunk
of it runs into two Branches.

e. 8. Another, the Mashes still less. This differs from the rest,
in that it is glittered from the Surface throughout to the Middle
of the Body. From the same Place. This is indeed nearly re-
lated to that e. 13. infra, and might as well be placed in that Sec-
tion. Vide e. 6. infra.

e. 9.
e. 9. Another, with one Branch arising out of it. This is partly reticulated, and partly striated on its Surface. From the same Pits.

e. 10. A small white Piece, bifurcated, or branching into two, and finely reticulated all over. It lay in a whitish Stone, thick set with the Pellicules of Ova of Fishes, and Fragments of Shells; having upon it likewise a fair Impression of a small Peæten. Found in a Stone-Pit on the South-East Side of Wakerby, Northamptonshire. Mr. Morton.

**PARTIS I. SECTIO III.**

*Corpora Coralloidea ramosa superficie stellata.*

e. 11. A pretty large Piece of a Coralline Body, of a brown Colour, dividing itself into three Branches, a few small whitish Stars appearing on some parts of the Surface of it. It lies in a grey Stone, in which are many Fragments of Sea-Shells of several sorts. Found in a Stone-Pit near Broadwell-Grove, (on the Edge of Oxfordshire) in Gloucestershire.

e. 12. A Piece of a ramose Coralline Porus, having its Surface thick set with Stellar Pores, very fair, and distinct, in a Quincunx Order. Found in a Chalk-Pit, upon the Downs, near Croydon, Surrey.

**PARTIS I. SECTIO IV.**

*Corpora Coralloidea, ramosa, superficial ad medullam striata; seu lineata.*

e. 13. A small Piece of a Coralline Body, with part of a Branch rising out of it. The Surface is black, and reticulated all over much like e. 8. It is not perfectly round, but of a flattish Shape. Both the Body and Branch are striated from the Surface to the Middle: and there are several Circles in the Substance of it intersecting the Striae. So that, somewhat resembling, in Shape and Texture, the Branch of a Tree. This sort is not unfitly called Stelechites, by the Writers of Minerals. From Tortenho in Cumberland: from whence I had several, little different, only that few of them had any Vestigia of Branches, being perhaps only Pieces. Mr. Morton.

e. 14. Another, of a dark yellow Colour, with three Branches rising out of it. This is not only striated from the Surface to the Middle, but has Striae running lengthways both on the Body and Branches of it. The Striae are so fine, that they are but just perceivable: and are in some places wanting, it seeming to have been fretted and worn. 'Twas found amongst the Gravel in the quadrangular Court of Sir Ralph Dutton’s House at Sherborn, Gloucestershire.
PARTIS II.  SECTION I.

Coralloiden Cylindriformia à Lamellis composita secundum Longitudinem, à superficie versus axem dispositis.

e. 15. A single Coralline Cylinder, $\frac{1}{4}$ Inch in Length, and $\frac{1}{4}$ of an Inch in Diameter, striated not only from the Surface to the Axis, but upon its Surface likewise with Striae parallel to its Length. There are also 12 or 13 annular Ridges round it, 'Tis of a grey Colour. Found with No. 5. supra, in the Lime-Stone-Pits near Dudley. At one End 'tis crack'd, and comprans'd as if by some external Force, before it had attain'd its present Hardness.

e. 16. Part of a Cylindraceous Body, an Inch in Diameter, and near as much in Length. The Plates passing from the Sides to the Axis are of a grey Spar, sprinkled very thick with small Sparks of a very bright Cristalline Spar. They are externally tinctur'd, in some parts, with a ferruginous Colour, and in others with a light brown. Found in sinking a Copper-Mine upon Ormshead, alias Lhandidno, in Caernarvanshire. There are found along with these Bodies grey Flints, whereof some parts are solid, and capable of a Polish; others are scabrous and porous. To these Flints the Bodies of the sort now described do frequently adhere.

e. 17. Many like Bodies, but thicker somewhat, and longer; some of them double the Length of the preceding, lying pretty close, and parallel to one another, in a brown Sand-Stone. They are most of them broken; and appear to consist chiefly of a grey Spar. From the Rocks at Helsfield, near Kendal, Cumberland. Mr. Fitz-Roberts informs me, that they are found plentifully on the upper Surface of the uppermost Stratum but one, standing all of them erect, with their Tops trending into the horizontal Fissure that parts the two Strata. He never saw any of them lodg'd, or wholly immers'd in the Mass of Stone. Two of them have Branches, of the same Constitution, rising out of them. Conf. e. 18. infra.

e. 18. A Piece of the same Stone, with several like Bodies in it. The Striae, tending from the Surface to the Axis, in these, are intercepted by several small white Circles within one another. From the same Place. See an Hint about the Origin and Formation of these, in the Account of the Spar, English Additional Native Fossils, b. 170. I am not without Suspicion, that the Honey-Comb-Stone is form'd in like manner; at least I have seen it in the horizontal Strata of Stone in some Quarries near Oxford. Conf. e. 22. e. 84, 85. infra, & e. 17. supra.

e. 19. A Mais of a pale brown Stone, in which are lodged, in various Situations, several Cylinders about $\frac{1}{3}$ of an Inch in Diameter. They are made up of Plates, placed lengthways of the Cylinders, so as to compose such a sort of Stellar Pore, as is described No. 12. supra, running through the whole Length of the Body.
Body. These Plates are set in a small Tube. The whole consists chiefly of a semi-pellucid Spar. Found loose in a Stone-Pit, on the Top of Hackness-Head, a high Hill near Scarborough, Yorkshire.

e. 20. Several like Bodies, but somewhat less, placed parallel to one another, and very thick, in a brown Flinty Substance. These consist chiefly of a whitish Spar; and are made up of white Plates, set as those of the former are, but have no Pores, the Intervals of the Plates being wholly fill'd up with a somewhat more pellucid Spar. Kendal, Cumberland.

e. 20*. Like Bodies placed also in the same manner, in a very hard grey Stone. From ——— in Brecknockshire.

e. 21. Several Cylinders, little different from the former, only that they are scarce so white, and set in a brown Stone. Many of the Cylinders in this, and the following Bodies to e. 30. inclusive, have not the Plates so distinct, and easily perceivable, as those of all the foregoing. Indeed several of them seem to be wholly solid. Shores of Minehead, Somersetshire.

e. 22. Several Cylinders like those of the precedent, set very thick in a dark Stoney Mafs. Found between Skegness and Ingoldmells, on the Shores of Lincolnshire.

e. 22*. Like Cylinders, about \( \frac{1}{2} \) of an Inch in Diameter, consisting of a white shining Spar-like Substance; but they are externally of a very dark grey, which is the Colour of the Stone in which they lie, very close, and parallel to each other. The Stone off which this was broke, tho' itself only a Fragment, was near two Foot long: and the Cylinders extended through it for that whole Length. Sent me by the very learned Dr. Cay, by the Name of Funci Lapidiei, or Marmor junceum. The Mafs takes a very good Polish. 'Twas taken out of a Quarry betwixt Carlisle and Cockermouth. The common Stone of the Quarry is much different; and this is found only in Spots: but, as he was informed, placed there in such a manner, that the Cylinders stood erect. Conf. e. 17. & 18. supra.

e. 22†. Another Piece of the same Stone. In this the Cylinders are many of them bent: not naturally, but by some external Force; they being apparently crack'd. There is in it a small Vein filled with Spar, probably since the Time of the Compilation of the Mafs.

e. 23. A Stone of a brown Colour, thick set with parallel Cylinders, little different from those of e. 21. & 22. In all these three, the Stoney Matter being stripp'd off by some external Force, the Cylinders appear on one Side of the Peble naked and fair in view. Found on the Shores near Sunderland along with e. 3.

e. 24. A grey Stone, in which the parallel Cylinders are of the same bigness, and placed as thick as those of the former; but are whiter, and more like Marine Coral, and some of them very plainly at the Ends radiated as a Star; that Form arising from the Position of the Lamina described already. Found on the same Shores.
Shores with the former. On one part of the Body are several Cylinders, in a Position transverse to the others: and one of them as thick again as any of the rest.

e. 25. A grey Stone, very thick set with like Cylinders. This, and several of the following, are worn smooth by the Sea; so that the Cylinders appear, on all sides, variegating the Stone in a very beautiful manner. From the Shores near Outhorne, Yorkshire.

e. 26. Another less, and of a brown Colour. Found between Skegness and Ingoldmells, on the Shores of Lincolnshire.

e. 27. Another black, the Cylinders smaller. From the same Shores.

e. 28. Another black, less, but the Cylinders somewhat larger. Found on the Shores near Scarborough, Yorkshire.

e. 29. Another, of a dark grey Colour: and the Cylinders, being white, variegate the Stone very prettily; making together a very elegant Body. This was found on the Shores of the River Humber, in Yorkshire, near Paul.

e. 30. A brown Stone, very thick set with greyish Cylinders, whose Ends appear on all Sides of it. Found on the Shore of the River near Thripland, in Westmorland. There were more of the same.

e. 31. A brown Stone, set with whitish Cylinders. These are in some measure porous, the Intervals of the Plates being not quite fill’d. Sea-Shores, Sunderland.

e. 32. A grey Stone, in which are several white spar by Cylinders, something larger than those of the former, and set in a Quincunx Order. Found on the Shores of Lincolnshire with No. 22. supra.

e. 33. A Mais, not quite so hard as a Pebble, of a very dark grey Colour. In it are several large Cylinders, being generally above \( \frac{3}{4} \) of an Inch in Diameter. The longitudinal Plates passing from the Surface to the Axis of the Body, are white, and their Interfaces fill’d with a pellucid Matter. The Coralline Bodies being white, and the Stone near black, appear together very beautiful. Found on the Shores of the River Tyme, near the Sea, at North Shields. This Stone, where broken, on one part exhibits an Impression of a Bivalve: and there are immers’d in it three or four Pieces of the Spina of an Echinus Ovarius. Confer, e. 34.

e. 34. A small Stone, of a dark grey Colour. ’Tis flat, being worn and ground by the Motion of the Sea. In this are Pieces of Cylinders of several Diameters, from \( \frac{1}{10} \) to \( \frac{1}{2} \) an Inch over: composed of Plates passing towards the Axis of the Bodies. They are intersected by other Plates, so as when broken, the Bodies appear reticulated. The cylindraceous Bodies in this, and e. 33. are white; and, both in Substance and Texture, resemble a sort of Flora, which we have from the Sea. This was found on the Shores near Skegness, Lincolnshire.
Coralloid Cylinders, set parallel to each other, in a grey Stone. This is worn in such manner, as very fairly to shew the interior Constitution of the Cylinders, which have Lamelle, from their Surface to their Axis, for their whole Length, like the rest of the Bodies of this Section: which likewise are intercepted by transverse Lamelle, like those in the following Section; which probably would appear to be the Case of several of the other Bodies in this Section, if their interior Constitution were as fairly expos'd to view. Pugill, near Hartly, in Westmorland.

Coralloidea tubulosa crebris lamellis transversis intercepta.

Vide Ind. supra, p. xxvii. e.

A Stone of an Iron-Colour, wherein are lodged many Tubes, appearing to be of a Spar, white, with a reddish Cast. They are generally about \( \frac{1}{2} \) of an Inch in Diameter, pretty near straight, and parallel to each other. The Stone is thick set with them. Throughout the whole Length of the Tubes, are Plates of the thickness of \( \frac{1}{15} \) part of an Inch cross'ing the Tube, the Interval between each Plate being of about the same Dimensions. Shores near Outborne, Yorkshire.

Another, brown; set pretty thick with Tubes of the same Size and Matter with those of the foregoing, only without any Mixture of Red. The Tubes are striated length-ways; and their Cavities set with Valvules, or Septa, like those of the former. Shores near Skegness, Lincolnshire.

Another; neither the Stone nor Cylindrick Tubes here differ from the former, only one of them has a Branch rising out of it. From the same Shores. Mr. Morton.

Another, but softer, grey Stone, thick set with like Cylinders, but irregularly placed; those of the precedent from No 17, lying generally parallel to one another. One of these Cylinders is crooked, as if bent almost double. From the same Shores.

A brown Nodule, very hard, and thick set with Tubes, variously placed. The Hollows of the Tubes have Valvules in them, which are cross'd by thin Plates passing the whole length of the Tubes. The Intervals being empty, the Tubes appear cancelled where broken. They much resemble a sort of Coralline Pori. From the same Shores.

A Stone of a light brown Colour, very thick set with small Tubes, in various Positions, some few of them a little crooked. The Diaphragms or Valvules are whitish: and have their Inter-
vals fill'd up with a brownish Sparry Matter. The Ends of several of the Tubes appear frilled, they seeming to have Laminæ passing from the Surface to the Axis through the whole length of them, of which indeed there are some Veitjgia in most of this Class. Found alone on the Road between Bradford and Leeds, Yorkshire.

Pars III.

Coralloidea columnaria pentaedra.

Sectio I.

Coralloidea oblonga pentaedra laminis à superficie ad axem tendentibus.

e. 41. A grey, semi-pellucid Flint, the Ground much like the Indian Agat, but thick set with white Pentagonal Columns, about $\frac{1}{4}$ of an Inch in Diameter. They are made up of several longitudinal thin Plates, all set edgeways towards the Axis. The Columns stand parallel to one another: and are placed at equal distances, being about $\frac{1}{2}$ of an Inch from each other. The Body being cut transversely, its whole Surface appears like a Net made up of pentagonal Mashes, with a pentagonal Star in each Mash. The Sides of the Columns are not exactly equal, and consequently not those of either the Mashes or Star. From——— in Wiltshire.

e. 42. An oval Plate cut transversely off the precedent Flint, and polished. It takes as good a Politure as any Agat: and is a wonderfully beautiful Stone.

e. 43. A piece of another, of the same sort, from the same Place. In this the Ends of the Columns terminate in the several stellar Cavities at the under Surface of the Flint, much like those in the larger Affrocites, or starr'd Honey-comb-Stone.

e. 44. A piece of another. In this the Stars, on one side, are hollow, so as exactly to resemble a common Species of marine coralline Affrocite: on the other side, the Hollows are fill'd with a flinty Matter. This Body shews plainly that these starr'd Coralloids were form'd after the manner of the starr'd Sea-Corals: and differ only in the additional flinty Matter. From the same Place.

Pars III. Sectio II.

Coralloidea oblonga pentaedra, Septis transversis distinctis.

e. 44. A Coralloid Body, of a grey Colour, made up entirely of several small quinquangular Columns, cross'd very thick with transverse Septa. At the end of each appears a small pentagonal Cavity, by which means that part of the Surface of the Body is reticulated all over. The Columns are not placed parallel; but so that they point and verge towards a Center. This was found in the great Lime-stone Pit, near Dudley, Staffordshire.
Another, the Reticulum upon this is very uniform, and elegant. The Stone is broken on one part: and appears within to be compos'd of a grey Spar. From the same Place.

Another, with a like Reticulum spread over the whole Surface of it. From the same Pit.

Pars IV.

Mycetita Coralloides.

Sectio I.

Mycetita Conoides, seu Calyciformes.

Two small Mushroom-stones, in form of a bluntish Cone, near half an Inch in length, and $\frac{1}{3}$ cross the broader End. They are of a grey Colour, and made up of Lamellæ running from the outer Surface to the Axis of the Cone. They terminate so as to make a round stellar Cavity at the broader End. The Lamellæ are held together by a whiter Matter interpos'd betwixt them. I collected several of them on the Shores of the Island of Sheppey, some of which are since dissolved, and appear to be compos'd chiefly of Vitriol, which shoots plentifully out of them, in form of a white Salt, after they have been some time exposed to the Air.

Fifteen other Mushroom-stones of near the same Shape with the precedent. Some of them are something bigger, and others les than those are. These are of a white Colour, and in Shape exactly resembling a sort of Coralline Fungus of Marine Origin, which I have by me. Some of them, at the small end of the Cone, expand themselves into a flat Plate as if they had adhered to some other Body; and two of them have fragments of Crusts of Echini affixed to that part of them; to which Crusts, sustain'd in the Water of the Deluge, the Particles, constituting these Mushroom-stones, affixed and concreted. Two or three of them appear somewhat bow'd or incurvated. From the Chalk-Pits of Pursfleet, Northfleet, Greenhythe, and Croydon.

Three other like Bodies, of a dark grey Colour, $\frac{1}{4}$ of an Inch long and a little incurvated. These end in a somewhat sharper Point than the former; and are compass'd by several annular Ridges. One of them, being broken, appears within to be made up of a grey Spar. From the Rocks near Kendal, Westmorland. There are also Mushroom-stones of this kind found at Torpenhow, in Cumberland.

Two others, of a red Colour, near as big again as the precedent, but of a compreft Shape. Otherwise they differ little from the former. From How-Lees, betwixt Newbiggin and Stainton, Cumberland. Mr. Nicholson, afterwards Lord Bishop of Carlisle.

Another from the same Place, not compreft, and much shorter than either of the foregoing.
Another Mushroom-stone, of a light brown Colour, \( \frac{1}{2} \) of an Inch in length. This consists of a round Stalk \( \frac{1}{2} \) an Inch thick, swelling at one end into a Head \( \frac{1}{2} \) of an Inch over; upon which is a shallow stellated Cavity. "Tis made up of Laminae placed as in e. 47. and 48. This was found in a Gravel-Pit, in a Valley near Wheat-Lands Mill, beyond Northleach, Gloucestershire.

Another, in shape not much unlike the former, only somewhat bow'd; but much larger, being \( 2 \frac{1}{2} \) Inches long, and the Head near two Inches over. The Plates, of which it consists, are white: and appear of a Substance very like Coral, where freed and clean'd from the grey earthy Matter which is insinuated into it. Out of a Lime-stone Quarry, near Dudley, in Staffordshire.

Another, somewhat bow'd and compress'd; \( 1 \frac{1}{2} \) Inch in length, and above \( \frac{1}{2} \) of an Inch over at the Top. There are four Angular Ridges environing it, at about \( \frac{1}{2} \) of an Inch distance from each other. It consists of a grey Spar: and was found on the plough'd Lands in the Fields on the West side of Oxford.

Another little different, only less, being but an Inch long. Found with the former.

Another of much the same Shape and Size with the precedent. This is made up of a grey Spar, but outwardly colour'd with a blue Clay, in which it lay. In a Pit at the Foot of Shotover-Hill near Oxford.

Another found in the same Clay tinged with it, and compos'd of a like Spar with the former. This is of a conick Shape, an Inch and half in length, and near as much in Diameter, at the broader end, where 'tis hollow'd, in manner of a Cup, for above half the length of the Stone.

A Mycetites, of a grey Colour, the lesser end appearing abrupt and about \( \frac{1}{2} \) an Inch over, the other near an Inch. "Tis of a Form somewhat compress'd, being scarce half an Inch high. The Laminae appear at both ends tending towards the Axis of it. From the great Lime-stone Quarry, near Dudley, Staffordshire.

Another like Body, but less, and of a white Colour, having a considerable cup-like Cavity in it. There arises out of one side of it, a Body of much the same Size and Shape with that. Found on the plough'd Lands with e. 56. and 57.

A Mushroom-stone consisting of several Laminae plac'd as in the former: and surrounded with several pretty high annular Ridges. "Tis inclining to a conick Form, though abrupt, and not coming to a Point. The Length of it is \( 2 \frac{1}{2} \) Inches, the Diameter \( 1 \frac{1}{2} \) where broadest. "Tis of a Ferruginous Colour: and by that, and its weight, seems to hold Iron. Found loose upon the Sides of St. Vincent's Rocks near Briflow, amongst many other like Bodies, beat out of the Stone by Rain and Weather.

Another about the same length, but not so thick, nor so taper'd as the former: nor are the Ridges about it so high. It seems to hold Iron.
seems to be of the same Nature and Composition with that: and
was found in the same Place.

e. 64. Another, little different from the preceding, but thinner,
and rough, as if eroded, on the outside. 'Tis broke in one
part, where there appears a whitish Spar incorporated with it.
Found also on St. Vincent's Rocks.

e. 65. A Body of the same Colour and Substance with those
e. 49. supra, with a stellar Cavity, and Laminæ passing towards its
Axis, thorough the whole length of it, as in those; tho' 'tis of a
different Shape, being not at all tapering, but of near the same
thickness, viz. ⅓ of an Inch in all parts, crooked, and distorted.
'Tis an Inch and half in length. From the great Chalk-Pit at
Northfleet, Kent.

e. 66. Another, of a grey Colour, near two Inches in Length,
and one and ¼ in Diameter. The Shape and Texture nearly a-
agreeing with the precedent: only the Intervals of the Laminæ
passing lengthwise of it, and appearing at the two opposite Ends;
are most of them fill'd with an adventitious brown earthy Matter;
whereas in that they are generally empty. Found on the Sea-
shores near Scarborough, Yorkshire. This, and the preceding
Bodies, being not only made up of Longitudinal Plates passing to-
wards an Axis, but likewise of a Shape nearly cylindrical, may be
more fitly refer'd to those, Pam. Seffl.

e. 67. Another, of much the same thickness in the middle as
e. 65. supra, but somewhat tapering towards each end. 'Tis
¾ Inch in length, of the same Colour, Substance and Texture,
and found in the same Chalk-Pit with e. 65. There are Parts of
the Bases of several Balani affix'd upon it.

Partis IV. Sectio II.

Mycetita forma compressa, seu Difcoides.

e. 68. Twelve Stones, opaque externally, and of a yellowish
brown Colour, but consisting within of a white semi-pellucid
Spar, as appears by one of these, and many others, which I have
broken. They are all of a compress Shape: but some more, and
some less. They are generally round, and all these are so except
two, which incline towards an Oval. One side of them, which
may be termed the Base, is generally flat, but in some of them
somewhat concave: the other somewhat rising and convex. In
the middle of this side is a little Hollow or Umbilicus; from whence
arise many very fine Sulci or Striae, and small Ridges, alternately,
passing on, of all sides, and terminating in the middle of the Bases.
Upon the Surfaces of some of those Stones appear many extensively
small glittering Sparry Sparks. The least is not quite ⅛ of an Inch
in Diameter, the largest above ¾ of an Inch. The thickest is half
an Inch in perpendicular height, the least not ½. These Stones are
called by Doctor Plot, Porpites, as much resembling a Hair But-
ton. These here were found generally on the plough'd Lands in the
the West of Oxfordshire, and those Parts of Northamptonshire, Gloucestershire, and Berkshire, which adjoin to it.

e. 69. Two like Bodies of a middle Size, the Surfaces of these are smoother, having the Striae so extremely fine as to be but just discernible by the naked Eye. Found on plough’d Lands on a Hill near Enjum-Ferry, Oxfordshire.

e. 70. Another, of a flat compreft Shape, almost an Inch in Diameter. The Basis of this is flat; but hollowed by the Edges rising into a Brim quite round. It is striated and ridg’d on both sides, but the Ridges in this and all the following to e. 79. are groffer than those of the precedent. Broadwell-Grove, Gloucestershire.

e. 71. This is little different from the preceding. Aulsworth, Gloucestershire.

e. 72. & 73. Two others, thicker than the foregoing and broader, being above an Inch in Diameter. The Bases of these are a little concave: and not striated to the Center as the former; but have sever al annular Striae, within one another, surrounding the Center. There appear some small glittering Sparks upon them: and having broke sever al of them, I find them to consist chiefly of a semi-pellucid Spar. Rijington Parva, Oxfordshire.

e. 74. A Stone of the same Texture and Breadth with the two last; but flatter, and of a dark grey Colour, all the foregoing being of a light brown. The Ridges in this, and the following, are thick fet with very little Knobs. From the Shores near Whitton, Lincolnshire.

e. 75. Another of the same Texture, Colour, and Constitution; only in this the striated side is a little Concave, and the op polite proportionably Convex. This also and the four following, from Whitton Shores.

e. 76. Another, not different, only less, being but about half an Inch in Diameter, and having its Basis flat. Whitton Shores.

e. 77. Another of the same Size and Constitution, only the Basis is concave. This also is of a grey Colour. Ibid.

e. 78. Another, ¼ of an Inch in Diameter, and somewhat more convex than the foregoing. The Basis of this is flat and striated, the Ridges between the Striae being punctulst, as are all the foregoing from e. 74. inclusive. The upper or convex part is smooth, except three annular Striae described, round the Um blicus of one within another. This is of a brown Colour. Ibid.

e. 79. Another, grey, and somewhat less; otherwise not different, only that the striated Basis is a little Concave. Ibid.

e. 80. A white Stone of the same Diameter with the last, but more concave in the Bafe, and more prominent and tending towards a Cone on the Convex part. The Bafe is smooth, excepting the Annuli encompassing its Center. The upper part is thick set all over with very small Cavities. From the great Chalk-Pit at Greenwich.

e. 81. Another from the same Place, less, but otherwise little different.
e. 82. A Stone of a grey Colour. The Base is pretty flat and distinguished by large circular Ridges and Furrows alternately. There are some Vestigia of other Ridges tending towards the middle and crossing these circular ones; so that this Body on the side appears as if cancelled. The upper part is Convex and has its Surface pierced all over with small round Holes at near equal distances. This is about $\frac{1}{2}$ Inch in Diameter. From the great Lime-stone Quarry, near Dudley in Staffordshire.

e. 83. A flatish Stone much larger than any of the former, being about 2 $\frac{1}{2}$ Inches in Diameter. Each Surface of this is somewhat convex, gradually lessening from the middle towards the Edges all round. The Edges are not plain, but curl'd or undulated. On one side there are circular Ridges, and Furrows, alternately, parallel to each other about the Center, in much the same manner as some of those described above. These are crossed by fine small Striae, passing from the Edges towards the Center. On the other side, where-ever 'tis freed from the Sand-stone, in which it was originally enclosed, 'tis covered with linear Striae, tending towards several Centers, so as to compose flat stellar Figures. Found in a Quarry on the North-side of Sherborn, Gloucestershire.

P A R S V.

A f r o i t a.

S E C T I O I.

A f r o i t a S t e l l i s P r o m i n u l i s.

e. 84. A Piece of a grey Stone, very hard, with Spar intermingled in small proportion throughout the whole Substance of it; but, on one part of it, which is flat, the Spar is in greater Quantity, and in some Places shot into small Crystals. From this flat Sparry Substance arise sexangular pyramidal Bodies. They are all nearly of the same Size, being about $\frac{1}{4}$ of an Inch in perpendicular, and somewhat more in Diameter at the Base. They are ranked, pretty regularly, in a Method, approaching to that of a Quincunx. They stand so close that their Bases are contiguous to each other, and are striated, from the Apex to the Bases, besides that the Striae of one run into and communicate with those of the other stellar Pyramids all round. In one part of the Stone is a Piece of a Shell of the Pedten kind. Found in a Quarry on Cowley Common near Oxford.

These Starry Efflorescencies were form'd on the upper Surface of a Stratum of Stone at a Partition, or horizontal Failure. The part of the Stone, of that Stratum, on which it had so concreted, is still joining the starry Efflorescencies. The Stratum being horizontal, the Efflorescencies are erect. There were two other thin Strata over that on which these were fix'd. Vid. e. 18. supra.
A Piece of a whitish Stone, very soft, and having one surface set all over with stellar Prominences, but much less than the former. Found in a Stone-Pit, on Shot-over-Hill, near Oxford, growing on the upper surface of a stratum, at the partition, after the manner of the precedent.

Partis V. Sectio II.
Astroites Stellis in Plano delineatis.

$e. 85. A$ roundish Body of the bigness of a large Walnut, of a yellowish brown Colour, like that of the Mycetites, $e. 68.$ and having also, like them, upon its surface, many extremely small, glittering, sparry Sparks. The surface is cover'd all over with stellar Figures, delineated in plano, about $\frac{1}{2}$ of an Inch in Diameter. The Striae of each of these Stars communicate with, and run into the Stars all round it. Having the stars apparent on every side, and there being not the least mark of Adhesion to any other fixed Body, 'tis plain this was form'd suspended in the midst of a free Fluid, as the other nodules were, at the Deluge, and is itself a Nodule.—Found upon the plough'd Lands in Yanworth-Fields, in Gloucestershire. This is a Nodule, as indeed all of this, and the following section, are; unless it be 90, which is so broken, I cannot well judge of it. I broke several of these: and found them, within, consisting entirely of a fine, white, transparent crystaline Spar.

$e. 86. A$ Stone much larger than the former. 'Tis composed chiefly of a coarse grey Spar; and has all over its surface Stars much like those of the former. There are small undulated Ridges on several parts of its surface, so as to make it a little resemble the Brainstone, or Astroites maritimus Coralloides undulatus. Found in a Gravel-pit, in the Road in the Vale beyond the River, near Wheatlands-Mill, Gloucestershire.

$e. 87. A$ large flat Stone, of the same Colour and Constitution with $e. 86.$ and having on the two opposite planes, Stars like those of that, but bigger, especially on one side. Some few of the Stars are hollow'd, and pass in manner of a stellar Pore into the substance of the Stone. The Striae of the exterior part of these Stars, which stand next the edge of the Stone, pass down by the sides of the Stone for the whole thickness of it, which is about an Inch, and terminate in the Striae of the Stars on the edges of the opposite Plane. From which 'tis natural to conclude, that, as in several that I have broken, to observe their Fabrick and Texture, both fossil, and marine, the Stars in this likewise pass the substance of the Stone quite cross from Plane to Plane. Found on plough'd Lands near Sherborn, Gloucestershire.

$e. 88. A$ large flat Body, of much the same Texture and Constitution, but of a grey Colour, excepting a large Vein of a reddish sandy Hue. The Stars in this are larger than in any of the former, being generally about half an Inch in Diameter. Found at the head of the Spring near Hilden, in the East-Riding of Yorkshire.
A Piece of Spar, white, except on one side, where it is
flat, and of a brown Colour. This Flat is pretty thick set with
Stars of the same size with those of e.86. only the Radij of the
Stars here sink somewhat deeper into the Stone; nor do the Ra-
idj of one Star pass on and communicate with the adjoining Stars,
as in that. From a Lead-Mine at Cumberland
Mr. Nicholson.

PARTIS V. SECTIO III.

Astroites Stellis depressis.

e.90. A Piece of Spar, white, except on one side, where it is
flat, and of a brown Colour. This Flat is pretty thick set with
Stars of the same size with those of e.86. only the Radij of the
Stars here sink somewhat deeper into the Stone; nor do the Ra-
idj of one Star pass on and communicate with the adjoining Stars,
as in that. From a Lead-Mine at Cumberland
Mr. Nicholson.

A Piece of Spar, white, except on one side, where it is
flat, and of a brown Colour. This Flat is pretty thick set with
Stars of the same size with those of e.86. only the Radij of the
Stars here sink somewhat deeper into the Stone; nor do the Ra-
idj of one Star pass on and communicate with the adjoining Stars,
as in that. From a Lead-Mine at Cumberland
Mr. Nicholson.

A Sparry Nodule of much the same Constitution with
87. and found in the same Gravel-Pit. The Surface is very un-
even, rising into large Knobs on all sides. The Extremities of the
Knobs are smooth, as if worn; but the Intervals, and other parts
left exposed to Attrition and external Injuries, are beautifully a-
dorn'd all over with little excavated Stars, each about \( \frac{1}{18} \) of an Inch
in Diameter.

e.92. A globular sparry Body, of a brown Colour, near four
Inches in Diameter, with several large Knobs about the Surface.
The whole is cover'd over with Stars, sunk something deeper in-
to it than those of the former. Found on the plough'd Lands near
Northleach, in Gloucefsire.

e.93. A Piece of white, semi-pellucid, crysfalline Spar. Part
of the exterior Surface is of a brown Colour, set with like Stars,
but somewhat larger, very fair, hollow'd pretty deep, and rising
gradually from the Center to the Ambitus of the Star, there ter-
minating in a pretty sharp Ridge all round. These Ridges com-
municating with each other, resemble a sort of Net-work, with
a Star in each Mesh. 'Tis indeed a very beautiful Object. From
a Quarry on the North-side of Irtingborrow, Northamptonshire.
Mr. Morton. See his Nat. Hist. of Northamptonshire, p. 183. He
informs me that there are found there, of these, of different Sizes,
from the bigness of a Hen's Egg to that of a Man's Head. Their Shape
also is different; but, being, as he says, all Nodules, generally tend-
ing towards a globular Figure. The Outfides of them are con-
stantly stellated all over. I cannot but take the Occasion to note,
that, tho' these Bodies agree well with the marine Astroites, as to
the exterior Appearance, and Form of the Stars; and doubtless
owe their Formation to much the same Agent: yet the Matter,
which constitutes each, is very different. For in the marine, that
Matter is ever opake; whereas in many of these, 'tis transparent.
The marine, indeed, hold all a little Spar, or Crystal; but these
terrestrial Astroites hold so much, as to be near wholly compos'd
of it. Vid e.90. supra. e.94.95. The fossil Corals are more ter-
rene, and ordinarily of greater specific Gravity than the marine.
Then there are fossil Corals, Myceste and Asferia, consisting of
Flint, Agar, Pyrites, and other Matter, much different from that
of the marine.

e.94.
e. 94. Another, from the same Quarry. The Edges of the Stars here are not quite so sharp or railed as in the former; and the Striae of the Stars communicate with, and pass into one another.

e. 95. Another, from still the same Quarry, little different, but that the Stars are not so depressed.

e. 96. A very large sparly Nodule, outwardly of a brown Colour, cover'd over with Stars of the same Size and Figure with those e. 93. From the plough'd Lands of Sherborn Northfield, Gloucestershire. Having broke several Nodules of this sort, I find they conffit within of a white, semi-pellucid, crystalline Spar. In some of these were Cavities; and these there had the Spar finely shot and crystalliz'd.

e. 97. A sparly Nodule divided into several Branches. 'Tis of the same Colour with the precedent, and barr'd all over like that. It much resembles a Species of a marine branch'd coralline Asfroita as to its Shape and Stars. But this is externally brown, and that white; this of sparly, and that of coralline Matter. Found in Stawell-Fields, Gloucestershire. There is of this sort, branch'd, found pretty frequently in the plough'd Fields, call'd the Chessles, near Cohn St. Allens, Gloucestershire.

e. 98. A Branch of a sparly Nodule of like Constitution with the foregoing. 'Tis in shape round, almost two Inches long, and half an Inch thick, but tapering towards one end. At the other 'tis abrupt; appearing like a Branch broken off from a bigger Body. Plough'd Lands in Tamworth-Fields, Gloucestershire.

e. 99. A Piece of a Nodule consisting of Spar, white within, and brown on the Surface. This is let thick over with small round Cavities, appearing as if punch'd, the bottoms of which are flat and star'd. On one side are Vestigia of stellar Pores paling towards the Center of the Stone. Farmington-Fields, Gloucestershire.

e. 100. 101. & 102. Two Pieces of a large sparly Nodule, with a stoney Callimus of a pale brown Colour, and oblong oval Figure, two Inches in length, and $\frac{1}{3}$ of an Inch in Diameter, that was lodg'd in the middle of the Nodule. The Spar is semi-diaphanous, white with a Cast of red, and made up of Plates wedged in with each other in various Positions. The external Surface is thick set with pretty large Stars. Found in a Stone-pit in the Earl of Dyer's Yard, in Northamptonshire.

e. 103. A very large sparly Nodule externally of a brown Colour. It has somewhat of the resemblance of a large Champignon before 'tis open'd, bunching out into a large round Knob at one end, the part proceeding from it being less round, and not unlike a Stalk. Much the greater part of it is cover'd over with Stars, very large, being half an Inch in Diameter. Found on the plough'd Lands near Aulsworth, Gloucestershire.

e. 104. Another Nodule, of like Colour, Texture, and Shape, but much less. The Stars in this are of the same bigness with those
thole of the former, but sunk deeper in. Found on the plough’d Lands in Sherborn-Northfield, Gloucestershire.

Partis V. Sectio IV.

Astroite foraminosi, sive à Superficio ad interiora Corporum excavati.

1. 105. A Body of a flat Figure, an Inch and a half thick, five and a half long, and three and a half in breadth. It consists of a grey Spar; but the Outside is brown. The two opposite flat Surfaces are cover’d all over, in an elegant manner, with Stars, not different from those of e. 94. except in smallness, these being generally \( \frac{1}{4} \) of an Inch in Diameter. Several of the Stars, especially on one of the flats, sink deep into the Substance of the Stone, making so many stellar Pores, with long parallel Striae running up their sides from the bottom to the Surface, and there communicating with the Striae of the neighbouring Stars all round. Some of these Pores pass the Substance of the Stone diametrically from flat to flat: and round the Edges of the Stone are long parallel Striae passing it transversely. At the bottom of all the Stars on one of the flats there is a little striated Stud rising up in the very middle of them. ’Twas found in a Stone-Pit between Oxford and Shottouer-Hill, Oxfordshire.

1. 106. A Piece of another, from the same Pit, little different, only to one of the Flats adheres a Body in Shape like that e. 102. but less. On this Body for the whole length of it, is a Row of stellar Ridges and Striae, which let fall Rays down by the Sides of it till they meet with those on the Stone to which tis affix’d.

1. 107. A sparry Body, of a somewhat lighter grey Colour than the two foregoing, with Stars upon the two opposite Planes. On one side they are flat, and of the same sort with those Part V. Sect. II. on the other they are concave, but of different Sizes, from \( \frac{1}{4} \) to \( \frac{1}{2} \) an Inch in Diameter. Some of them pass deep into the Stone: and on the Sides are Striae passing diametrically between the two opposite Planes. Found in the Highways near Baxieyfe in Berkshire, near Oxford.

1. 108. A grey sparify Body, with Stars, about \( \frac{1}{4} \) of an Inch in Diameter, on the two opposite flat Surfaces. Some of them sink pretty deep into the Stone. In all parts of the Sides of this where broken, appear Lines very numerous and thick, which seem to be the Edges of long Plates pervading the Body diametrically from the Stars of one to those of the opposite Plane. On one side of the Stone these Plates are cross’d by others, so as to appear cancelled, very like some of the marine Pori. Found near Scarbourgh-Castle, Yorkshire.

1. 109. A sparify Stone of a blueish grey Colour, with Stars, much like those of the foregoing, on the two opposite Planes. All round the Sides of it are Canals, like parts of stellar Tubes, passing cross the Body. The Longitudinal Plates of these are interlaced.
terfected by others exactly in manner of some of the marine Fori.
Out of a Cliff on the Shores near *Whiston, Lincolnshire.*

e. 110. A Piece of a white Sparry Body, on the Surface of which are Stars passing pretty deep into the Stone, about a quarter of an Inch in Diameter. The Striae of these are not so deep and distinct as in the preceding; and in some are hardly perceivable. Found somewhere in the Road betwixt *Enham-Ferry* and *Oxford,* where there were more of the same; but I cannot remember the Place more particularly.

e. 111. Another Piece from the same Place, little different, but that the Stars are generally less, and smooth, as if the Striae were effaced, they hardly appearing.

e. 112. A flat Body, with hexagonal Cells somewhat above a quarter of an Inch over; and very much resembling an Honey-Comb. The Cells are prettily crenated or notch'd quite round the Edges; but not striated down to any depth. These Cells are pretty deep, and some of them pass quite thro' the Body diametrically. The Partitions of the Cells, where broken, are white; but all the rest of the Body is of a ferruginous Colour. Found at the Foot of *St. Vincent's-Rock,* near *Bristol.*

e. 113. Another with like Cells. The Partitions of these are compos'd of little Bullæ or Granules, of a glittering Spar, white, with a Cast of red. The Cells are all deep; and some of them pervade the Body diametrically. Found upon the Shores of the River *Ardin,* near *Leonards-Castle-Abbey,* in Cumberland.

**APPENDIX.**

e. 116. An Astroites of the foraminofe kind, *Part 5. Sect. 4.* little different either in Substance or Texture from that e. 105. but this Stone is not quite half so big. Found near *Abbington,* in *Berkshire.* They are pretty common there.

e. 117. Astroites Stellis prominulis, much like that e. 84. only in this the Stars are something larger. Found on *Bullington-Green,* near *Oxford.* It belongs to *Part 5. Sect. 1.*

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**CLASS VI.**

**Crystals, Spars, and crystalliz'd Gems.**

*Vid. Preface infra.*

The Classical Method of these Bodies.

**PART I.**

**Incrustations of Spar, and other like Matter, upon Bodies in Springs; and Rivulets.**
PART II.
Simple Spars, found in the perpendicular Fissures of the solid Strata.

PART III.
Spar form'd into Plates.

SECT. 1. Plates of Spar, plain, concreted upon the Stone of the Sides of the perpendicular Fissures.

SECT. 2. Plates of Spar, with Tuber, and Efflorescencies, upon them, concreted upon the Stone of the Sides of the perpendicular Fissures.

PART IV.
Stalactite, or Spar form'd into the Shape of Icicles.

APPENDIX. Stalagmites, Drop-stones, or Spar form'd into small roundish Masses.

PART V.
Crystals, and crystalliz'd Spars.

2. Spars, and Crystals, shot into a cubic Form.
3. Trigonal Pyramidal Talky Spars.

ARTICLE 1. Those that are white, or diaphanous.
2. Those that are colour'd, yellow, red, purple, black.

SECT. 2. Sparry and crystalline Pyramids, join'd Base towards Base by the Interposition of an hexagonal Column, adhering to Sand-Stone, diaphanous, and colour'd.

PART VI.
Spars, and Crystals, independent, and in Nodules.

SECT. 1. Hexagonal, sparry, and crystalline Pyramids, join'd Base towards Base by the Interposition of an hexagonal Column, not adhering to any other Body, and without a Root.

ARTICLE 1. Those that are single, and apart.
2. Those that are join'd, several in one Mass or Nodule.

SECT. 2. Echinated, sparry, and crystalline Balls.
3. Concave, sparry, and crystalline Balls.

PART VII.
Spar of a strigated or ridge'd Form. And Spar shot into the Form of Erica or Heath.

The Names given to some of these Bodies by Writers, and others.
**Extract of the Observations, relating to the Origin, Formation, and Natural History of Crystal, Spar, and the crystalliz'd Gems.**

**Of Spar.**

1. **The Uses of Spar.**

Spar, abso'ring Sulphur, in the Ores of Metal, in the Fire, promotes their Fusio'n.

— incrusted, call'd *Osteocolla*, used as a Conglutinator of broken Bones, f. 5.

— white, given in White-Wine in Cases of the Stone, and nephritic Affections, f. 18. 21.

— in the Cholic, f. 21.

2. **The Place in which Spar is found.**

Spar, in Fissures of Stone, f. 16. 18. & seq.

— in Fissures of Marble, x b. 1.

— in Fissures of Coal, f. 9. g. 17. & seq.—Of Canal Coal, g. 10.

— finely crystalliz'd on the Sides of the perpendicular Fissures of Coal, f. 108.

3. **The various Colours of Spar.**

Spar, white, f. 18. 20.

— with a Cast of yellow, f. 76 Θ.

— yellow, f. 76 †. 94. & seq.

— of a reddish yellow, f. 17.

— tranf-lucid, green, f. 16. 65 †.

— blue, f. 144.

Stalactite, red, out of an Iron Mine, f. 66. 67.

Spar, with a Cast of Purple, f. 91.

— with a black Hue, owing to Coal concreted with it, f. 108.

4. **The Constitution, Origin, and Formation of Spar.**

The Constitution and Formation of Spar, f. 28, 29.

Spar, white, breaking in Rhomboids, f. 24.

— pellucid, breaking in Rhomboids, f. 25.
Spar, white, breaking in Plates, f. 29*.

Sparry Matter, brought out of the Strata of Stone by Water, fix'd in successive Incrustations, and spread over the Sides of the perpendicular Fissures, f. 30, 31, 32, 34, 35, 36, 36*.

Sparry Incrustations, with Tubera, and Efflorefcencies upon them, form'd by Water on the Sides of the perpendicular Fissures, f. 36†. & seq.

Spar grows, and is form'd, to this Day, f. 83.


— form'd at this Day on the Top of Works deserted under Ground, f. 61, 62.

— on the Top of a Brick Vault, f. 63, 64.

6. Other Minerals, and Ores of Metals, incorporated with Spar.

Spar, concreted with a yellow sulphurous Marcasite, f. 91.

—— concreted with Lead-Ore, f. 92†. 183. Vide Class 6.

—— with Copper-Ore.

—— with Tin-Ore.

—— with Iron-Ore.

Of CrystaL

1. The Figure of Crystal.

Crystal. Its natural Form hexagonal. When it assumes any other Form, that is owing to the Admixture of some adventitious mineral or metallic Matter concreted with it. f. 97. Conf. Pref. infra.

—— in a cubic Form, f. 87. & seq. This Form owing to Lead incorporated with it, f. 87, 92†. n. 132.

All other Variations of its natural Figure, owing to metallic Mixtures with it. n. 132.

2. The Colours of Crystal.

Crystals, clear and diaphanous, f. 99, 120. & seq.

—— with a Cast of Yellow, f. 87, 90†. 116, 128, 141*. n. 132.

A Topaz, f. 177, 177*.

This yellow Colour is owing to Lead incorporated with it, f. 87, 128. n. 132.

—— with a Cast of Green, owing to Copper, f. 93†.


—— with a Cast of Purple, owing to Iron, f. 91, 93, 119, 129, 141. Conf. f. 118.

—— of an Amethystine Colour, owing to Iron, f. 92, 92†, 118, 176*.
The various Colours of Gems.

Spars, Crystals, and Crystalliz’d Gems.

PREFACE.

Crystal was thought by the Antients to be only Water congeal’d, in long Tract of Time, into an Ice, harder, and more durable than the common. ’Twas for that reason they gave this Stone the very Name [κόσμαλλος] that they did to Ice. Plin. l. 37. c. 2.—“Crystalllum,—gelo vehementiorc concreto. Non alibi certe reperitur, sed ubi maxime hibernæ nives rigent, glaciemque est; unde nomen Græci dedere.”—Sexangulis nascitur la-”

Spar is call’d Flujs by the German Mineralists: and by Agricola, and the other late Writers of Fossils, Fluor. Probably because they imagined this also to have been form’d, ex Fluido, or out of Water. In my Nat. Hist. of the Earth, Part IV. Collect. 6. &c. I have set forth the true Origin of Spar and Crystal: and shown that Water is only the Agent that educes the Matter, of which they consist, out of the Strata, and compiles and forms it in the perpendicular Fissures. Nor are they less mistaken, who imagin’d Spar had the Name Fluor, a fluendo in Igne; for it will not melt, but calcines in the Fire. ’Tis indeed sometimes used, in the Fusion of Ores, like Lime, to absorb the Sulphurs that may be incorporated with them. By that means it removes indeed what would hinder the Fusion of those Ores, and so by accident promotes their Fusion: but is not really a Flux itself.

One sort of Spar is compos’d mainly of Lac Luna, incorporated with Crystal. Vide f. 41. f. 46. f. 70. & o. 105. infra.

Talc is likewise frequently found incorporated with Crystal and Spar: as in f. 29*. & 29†. f. 30. f. 34. and probably in the Sta-lacites, f. 55. & seq.

There is in all Spar more or less of Crystal: Which renders it more or less diaphanous, in proportion to the Quantity of the Crystal incorporated with the Earthy, Stony, Mineral or other Ingredients in the Composition of the Sparry Mafs.
Spars, Crystals, and Crystalliz'd Stones.

PART I.

Incrustations of Spar, and other like Matter, upon Bodies found in Springs, rising from among Strata of Stone, or Rocks. [Confer. Nat. Hist. Earth. Part IV. Conf. 7, & 13.]

f. 1. Three Cylindric Incrustations, found in a Brook proceeding from Rushbank-Spring, Harrington-Grounds, in Northamptonshire.

These, and the following, to f. 5. inclusive, have little Spar in their Composition; they consisting chiefly of a grey light earthy Substance; but being found with those that contain more Spar, and form'd in the same manner, I take the liberty to range these with them.

f. 2. Several others, of different Figures, found part of them in a Rivulet, the rest in a Marl-Pit, in a Field not far from the Church of Norleach, Gloucestershire. Some of these, being broken, shew the various Crusts, successively one within another. The Straws, or other slight Bodies, on which these Incrustations were made, are since, in Tract of Time, perish'd and disappear'd; the Place, where they were, remaining.

f. 3. The common Garden Snail-Shell incrust'd over. Out of the same Rivulet, near Norleach.

f. 5. An Incrustation, seeming to have been on a Stick, since perish'd. This is the Osteocolla Officinarum: which is recommended by the common Pharmacologists as an Aborbent, and Conglutinator of broken Bones; whence it has its Name. Taken out of still the same Rivulet.

f. 6. A Land-Snail, incrust’d over with a pretty hard fine Stoney Matter, mix’d with Spar. Found in that which is called the Petrifying Spring, near Maidwell, Northamptonshire. I have had several like Incrustations from the same Spring.

f. 7. Bits of Sand-Stone, Sticks, and other Bodies, incrust'd over, and cemented together with a slight Stoney Matter with Spar. Found in the Head of a Spring in Chedworth Town, four Miles from Cirencester, Gloucestershire.

f. 8. A light Earthy, Stoney; and Sparry Matter, incrust'd and affixed to Oak-Leaves. Found in a Brook near Brickworth, Northamptonshire.
Part II.

Simple Spars found in the Fissures of the solid strata:

f. 9. Fine white Spar in Veins or Fissures of Coal; from Meffham, Leicesterfhire. Conf. f. 108. infra.

f. 10, 11, 12, 13. Plates of a grey Spar, found in the Veins or Fissures of Canal-Coal, at Haigh, Lancashire.

f. 16. A tranflucid green Spar. From a Fissure of the Strata of Stone, in the Copper-Mines, Croftgill, Cumberland.


f. 17*. Another like Spar, very ponderous. Found in the Pits of Fullers-Earth, near Rygate, Surrey.

f. 18. White Spar, from Charter-Houfe Liberty, Mendip; found in the perpendicular Fissures, both with the Lead, and alone. The Physicians thereabouts call it Lapis Lazuli Saturni; andufe it for the Stone in White-Wine, Dol. 9 fs.

f. 19. White Spar. From a perpendicular Fissure in the great Limestone-Pit, Dudley, Staffordfhir.

f. 20. Spar, white, with a Caf of brown. Wooky-Hole, near Wells, Somerfheire.

f. 21. Spar, almoft as pellucid as Crystal. Out of a Lead-Mine at - - - - - in Cumberland. Here, and in Yorkshire, they use this fine and clean Spar, powder’d, in the Cholic; as also in Ne-peritic Cafes, taken in White-Wine.


f. 25. Another Sample more tranfparent and cryftalline. From the fame Lead-Mine. I take this to be the Selenites of Dr. Scheuchzer, Geogr. Physf. and of some of the German Mineralifhs.

f. 28, 29. Two Pieces of a pellucid Spar, lineated with black in fuch manner, as to fhow the Order and Succedion of the Matter in the Formation of the Mafs. From a Lead-Mine, near Haddon, Derbyfhir.

f. 29*. White Spar, breaking in Plates. Out of a Lead-Vein in Newlands, Cumberland.

f. 29†. Like Spar, but more fhattery, and the Plates more apt to part. Out of another Lead-Mine, Cumberland.

Part III.

Spar form’d into Plates.

Sect. I.

Plates of Spar, plain, incrufed on Stone on the Sides of the perpendicular Fissures.

f. 30. A thin flat Plate or Cruf of brown Spar. From Benwell Coalery, Newcaflle. It was twelve times as broad: and thus thin
thin throughout. It consists indeed of two Plates of Spar, a browner and whiter, successively apply'd; and striated a-cross. It is common to find Spar of this Constitution, spread over great Tracts of Stone in the Sides of Fissures in Quarries and Mines.


f. 32. A whitish brown Sparry Cruft, striated a-cross, consisting of several thin Incrustations, and shewing the successive Application of each to other in the Formation of the Body, by Water running down the Side of a Fissure of Stone, on which this Cruft was form'd and affix'd, in Llany Monach-Cave, near Oswestry in Shropshire.

f. 34, 35. Two Pieces of Spar, composed of several Crufts variously apply'd to each other. Sherborn, Gloucestershire.

f. 35*. White Spar, form'd into thin Plates, placed in very various manners, so that they intersect one another, and make Cells of different Forms and Capacities. The Cells have been fill'd with pale brown Earth, part of which is still remaining in them. From a Quarry near Caple Tar, Devonshire. This fine Earthy Matter, coming forth of the Strata with the Spar, concurr'd to the forming the common Mafs; but the earthy Corpuscles not being capable of concreting and consolidating, as the Spar did, remain'd loose: and when dry, was like a fine Powder, and easily dissipated. There was a great deal of this Sparry Matter, with the Cells thus fill'd with this Earth, in this Fissure.

f. 35*. Like Spar. Uppingham, Rutlandshire.

f. 36. A whitish Sparry Cruft, with semi-lunar Processes on the Surface of it, owing their Form to the dribling of the Water that pass'd over it. The Convex of the Arches of these Processes hung downwards. From a Quarry near Turk-Dean, Gloucestershire.

f. 36*. Spar, flat: with a Cast of Yellow; consisting of numerous thin Incrustations successively cast, by Water, each on other, very much like the Spar that composes the Septa or Partitions of the Ludus Helmontij that is found in Sheppey Island. Harwich-Cliff.

PART III. SECT. II.

Plates of Spar, with Tubera and Efflorescencies upon them, incrust'd on the Sides of the perpendicular Fissures of the Strata of Stone.

f. 36*. A large Knob, arising from a Plate of Spar, incrust'd on the Side of a perpendicular Fissure in Tanworth Quarry, Gloucestershire.

f. 36*. Two large oblong Tubera, arising from a Plate of Spar, incrust'd on the Side of a Fissure of Stone in Rancomb-Park, Gloucestershire.

Another, Wooky-Hole, near Wells, Somersetshire.

39.40. Yellowish Efflorescent Sparry Incrustations on Stone, on the Side of a perpendicular Fissure of a Quarry near Yanworth, Gloucestershire.

41. A Body consisting of Spar, with some Lac Luna, found frequently in these Quarries, incorporated with it. 'Tis finely imbellisht with Tubercles and Efflorescencies. Out of a Fissure of a Quarry near Norleach, Gloucestershire.

42. Another, not much different. Out of a Fissure of a neighbouring Quarry.

42*. A Tuberous Efflorescence, of a fine white Spar, found adhering to a Crust of like Spar, on the Side of a Fissure in a Lead-Mine, at —— in Cumberland.

43.44. Two white Sparry Incrustations, with Efflorescencies, in Form of Shrubs upon each, form'd by the trickling of Water in the Fissure of a Stratum of Stone, to the Sides of which they, with many more of the like, adher'd. Out of the same Quarry, with the last.

45. Another, very thick set with Sparry Efflorescencies. The same was continued over the Side of a Fissure, to the Extent of 3 or 4 Foot. Yanworth-Quarry, Gloucestershire.

46. Another, with like Efflorescencies. This is extremely light, and is compos'd chiefly of that Matter which Dr. Plot, and some other Naturalists, call Lac Luna, incorporated with a little Spar. Found in a Fissure of a Quarry on the West-Side of Oundle, a quarter of a Mile from the Town. Northamptonshire.

50. A brown Sparry Efflorescence, near Sir Christopher Mufgrave's House by Kirkby-Steven, Westmorland.

52. Very luxuriant Efflorescencies of a brown Spar, made by Water, at the foot of a Hill under a Hollow of an old Ash in Maidwell-Dale, Northamptonshire.

53. From Knaresborow, Yorkshire. Out of that call'd the Petrifying Spring there.

53*. A Piece of the Stony Accretion on the Walls of Bath, mention'd by Dr. Guidot, de Thermis Britan. p. 165. In several Parts of the City-Walls of Bath, in a Garden on the South-West Side of the Town, are Stony Accretions, and some pretty hard. They increase, and are inlarg'd daily: and consist only of the arenaceous Matter that is beat down by the Weather from the upper Stones; which, falling upon the lower, is concreted and affixed upon them, by means of the interposing of a little Sparry Matter that drains out of the upper Stones: or rather, out of the Earth on the Inside of the Wall; which is several Foot higher than that on the
the Outside in the Garden. Where the Stones in the Wall, above, are not fretted, and the Sand beat off, these Accretions are nowhere found. Nor are they every where found, where the Sand is beat off above: but only where there are Jets in the Stone, for the falling Sand to settle upon, or where the Wall bulges out to receive it. And 'tis observable, that the largest Accretion is at a kind of Angle of the Wall, which is much expos'd and worn by the Weather, and where there is a Bulge near the Ground. I shaw'd this to Dr. Guidot, and he affents to these Conjectures about the Formation of these Accretions.

PART IV.
Stalæcitæ, or Spar, form'd by the dropping of Water, in Fissures, and subterraneous Caverns, into the Shape of Icicles.

f. 55. Part of a Stalæcitæ of a Cylindric Shape, and about an Inch in Diameter; having adhering to it a Piece of the Stone from whence it hung in the Fissure of a Quarry at Windrafs, Gloucestershire. 'Tis fiftulous, having a Foramen at the Axis for the whole length of it. 'Tis striated from the Surface to the Foramen: and is compos'd of many thin cylindric Crufts, induced each on other successively, by the Fall of Water, bringing Spar with it out of the Strata.

f. 56. A Stalæcitæ. King's-Wesfon, Gloucestershire. This was near two Foot long: of much the same Constitution with the former; but not fiftulous.

f. 57. A Stalæcitæ. From a Lead-Mine, at Hopton in the Peak, Derbyshire. This is of a fine white Spar, has a Fiftula at the Axis, to which the Striae tend, and which the Crufts surround: and is much of the Shape of the Belemnites fusiformis; but larger, being a Foot in length.

f. 58. A Stalæcitæ, of like Spar, but smaller, and not fiftulous; having adhering to it part of the Stone, of the Side of the Fissure, from whence it hung during its Formation. From the same Lead-Mine, at Hopton.

f. 59. Another, of like Spar. This has a Fiftula, not at its Axis, but to one Side; to which all the Striae tend. From the same Lead-Mine.

f. 61, 62. Two fine slender Stalæcitæ, found hanging down from a black Stone, at the top of an old deferted Vault, in Benwell Coalery, Newcastle. They were form'd since the Vault was made, and are a Proof that these Stalæcitæ are form'd to this day.

f. 63, 64. Two very light, thin, fiftulous Stalæcitæ, found hanging down amongst others, in great number, from the Top of a Brick Vault, between the Gardens at Cliveden-Hoyle, near Maidenhead, Bucks. These afford another incontestible Proof of the present Growth of the Stalæcitæ.
A small Sparry Stalactites. From the Devil’s Arse in the Peak.

Four Stalactites, of Constitution much like that of f. 55: only the Spar is somewhat whiter, and more transparent, found hanging down from a Jet of a main Vein in a Lead-Mine, in Arkendale, Yorkshire. They hung near each other: and grew till they became contiguous, and united.

Two Stalactites, having their exterior Surface set all over with small Cryftals. The larger being broken, fhews the interior Spar, of which it consists, to be of a green Hue. Out of another Lead-Vein, Arkendale.


A white Sparry Stalactites, with a fine Sparry Efflorefcency at the Top of it. From Benwell-Coalery, near Newcastle.

A white Spar, with two Proceffes of Stalactita hanging down from it. Out of a Fiffure in Yanworth-Quarry, Gloucefelshire. Here are fome Appearances of Lac Luna in this: as indeed there is much of the Spar of the Country hercabocts.

APPENDIX.

Stalagmites, Drop-Stones, or Spar form’d into small roundifh Maffes.

White Sparry Stalagmite. Wookey-Hole, near Wells, Somersetfle. They lay on the Floor, but fcm to have been Efflorefcencies fallen down from the Sides of this Grotto.

Four grey Sparry Stalagmite. Elden-Hole, Peak, Derbyfhire.

CLASS VI. PART V.

Cryftals, and Cryftalliz’d Spars.

SECT. I. Spars cryftalliz’d in an irregular manner.

White Spar, feimpellucid, confifting of flattifh Pieces, set edgeways each by other. There was a great Quantity of this Spar, about 6 Foot deep, in a Quarry near Pickering, Yorkshire.

Like Spar, but the Pieces lefs. From a Stone-Pit near Oundle, Northamptonfle.

Like Spar, out of a perpendicular Fiffure of a Lead-Mine, Arkendale, Yorkshire.

White Spar shot into fmall Columns, Wookey-Hole, near Wells, Somersetfle.

Like Spar, but with a Caft of yellow, and Sparks of Lead-Ore. From a Lead-Vein, Newlands, Cumberland.

Spar, brown, columnar, in three Orders or Crufts, one on another. From the Marble Quarry at Caddown, near Plymouth.
f. 76. Spar, columnar, yellow, with part of the Stone, of the side of the Fissure, whereon it concreted, adhering to it. From Hartly Lead-Mines, Westmorland. This fort is not so frequent here as the cubic is.

f. 76·X. A white, opake, cauky Spar, shot or pointed. Hinxton, Cornwall.

f. 76·Y. White columnar Spar. Out of a Stone-Pit near Sherborn, Gloucefsire.

f. 77. White Spar, found in the Fissure of a Quarry near Stroud, Gloucefsire. The Shoots arising from each side of the Fissure, obliquely, met and united in the middle.

f. 78. Out of a Quarry near Sherborn, Gloucefsire. There's part of the Stone of the side of the Fissure, whereon it concreted: There are in this Stone numerous Fragments of Shells, and Pellicles of the Ova of Fishes. The Shoots of the Spar seem to be trigonal: and if so, this belongs to Sect. 3. infra.

f. 81. Spar, irregularly crystalliz'd in small Sparks: and call'd Croyl-Stone. From Works Worth in the Peak, Derbyshire.

f. 82. Spar, from the side of a Fissure, shot into round Tubercles, somewhat larger than Peas, with their Surfaces set all over with small Crystals. Portland great Quarry.

f. 83. Spar, part shot into very small Crystals: part into Tubera and Efflorefcencies in a very uncommon manner; struck off the Top of an antiently wrought Cavern of a Lead-Mine, of Mr. Bathurst, on Molder-side-Hill. Arkendale, Richmondshire.

CLASS VI. PART V.

SECT. III. Spars, and Crystals shot into a Cubic Form.

Androdamas * Plinij.

f. 87. Crystal, shot into Cubes, about 3 of an Inch in Diameter. They are transparent, excepting a Cast of Yellow that appears in all of them. They were found concreted together in great numbers on the side of a perpendicular Fissure in a Lead-Mine, near Kirby-Stephen, Westmorland.

f. 88·98. Two larger Cubes, with others les. From the Lead-Mines of Sir Chr. Musgrave, at Hartly Castle, Westmorland.

f. 90. Two Clusters of Crystalline Cubes. Also four single Cubes; from the same Mine.


f. 91. Cubic Spar, with a Cast of Purple: and some Grains of a yellow sulphurous Marcafite. From the Lead-Mine at Neat-Head in Cumberland. These Cubes have probably, with the Lead,

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which determined the Crystal to shoot into Cubic Figures, an infinitely small Admixture of Iron, to which the purple Hue is owing.


f. 92 †. Several Cubes of an Amethystine Hue, crystalliz'd confusedly together. From the Lead-Mines of Crofsells, Cumberland. Out of a Lead-Vein: and there are Masles of Lead-Ore, in the part, whereon these Cubes are crystalliz'd.

f. 93. Several small Cubes, very fine, ting'd with a light Purple. From a Vein of Iron-Ore in the Skrees, Cumberland.

f. 93 †. Small Cubes, very fine, some ting'd Green. From a Vein of Copper-Ore in the Skrees Mountain, Cumberland.

CLASS VI. PART V.

SECT. 3. Trigonal, Pyramidal, Talty Spars.

f. 94. Spar of a yellow Hue, shot into numerous trigonal pointed Shoots of various Sizes, found growing to one side of a perpendicular Fissure of a Stratum of Freestone in digging, for laying a Foundation for Sir J. Guise's House at Randcomb, Gloucefhire. On one side of this appear several trigonal Surfaces, which perhaps are the Bales of the trigonal Shoots. This fort is also found in Switzerland: Dr. Scheuchzer calls it Fluor Crystallinus trigonus. Specim. Lithogr. Helvet. p. 29.

f. 95. Lesser trigonal Shoots of a yellow Spar. Out of the great Quarry in Portland.

f. 96. Others, not quite so yellow. Fairford, Gloucefshire.

CLASS VI. PART V.


ART. 1. Those which are white or diaphanous.

f. 97. Hexangular Sprigs or Shoots of Crystal of various Sizes, some clear, others a little foil'd, with an Accretion of Tin, rising out of a white Spar, which was affix'd on the side of the Stone in a perpendicular Fissure, in Carrack-Gloofe Tin-Mine, Cornwall. They grew on the sides of the Load of Spar, which stands parallel to that of Tin-Ore. They are commonly found in great Numbers in Caverns of the Spar. The People there call them Cornifh Diamonds. There is much Water in the Load of Spar and Ore. This Hexangular, is the natural Figure of Crystal. When it assumes any other, that is owing to the admixture of some adventitious mineral or metallic Matter concreted with it.

f. 98. A single Column, or Shoot, very large, being three Inches in Length; and 1 and ½ in Diameter near the Base. From the fame Fissure.

f. 99.
f. 99. Five others, not so large; but, excepting the Soil on the Surface, most of them near as transparent as the Alpine Crystal. From the same Fissure.

f. 100. Part of a large hexagonal Sprig, with Bodies in it, black, slender, round, and very much like Hairs. Hinxton, Cornwall. These Bodies are, doubtless, composed of Tin, which assumes that black Colour when crystalliz'd.

f. 100 x. Part of another, broke so as to shew the internal Constitution of it, which is much like that of the Marcahte, i.e. infra. From the same Tin-Mine as the precedent.

f. 100 †. Several Sprigs of Crystal, of different Sizes, from a perpendicular Fissure in Carrack-Gloose Tin-Mine, Cornwall.

f. 100 *. Others, more transparent, than those found in the Tin-Veins; from Tindagial, Cornwall. These were found with Spar, in a perpendicular Fissure, in the Slate Quarry at Dennys-Bowl, Cornwall.

f. 100 ‡. Two Crystal Sprigs or Columns, and part of two others, crossing one another at diverse Angles. During the Time of their Formation part of the Matter, which composed each, being within the Verge of the Matter of the other, the Columns were incorporated with, and lock'd into each other. The like Accident is observable in some of those, f. 97 & f. 100 †. From a perpendicular Fissure in Carrack-Gloose Tin-Mine, Cornwall.


f. 102. An hexagonal crystalline Shoot, with black Lines in it. From St. Vincent's Rock. Being broke, in one Part, it shews somewhat of the Texture of the Stone, and the manner of its Concretion.

f. 103. Three Shoots, out of a Fissure in St. Vincent's-Rock.

f. 104. A Mass with large Pyramids. From a Lead-Mine, at Cahrborne, Cumberland.

f. 105. Found on the Wafts, between Alston-Moor, and Galmesby, Cumberland.

f. 108, 109. Spar, on Coal, finely crystalliz'd. From Farringtons Coal-Pits, Somersetshire. In some of the Crystals there appears a fine black Matter, probably some fine Parts of the Coal, incorporated with the Crystalline.

f. 112. Spar, crystalliz'd, with part of the Stone whereon it concreted, on the side of a Fissure, in a Quarry, near Cheltenham, Gloucestershire.

f. 113. Hexagonal crystalline Shoots, small, but very sparkling. Out of the Fissure of a Quarry by Keynsham, Somersetshire.


f. 114 x. Hexagonal crystalline Shoots, with part of the Stone, of the side of the Fissure whereon they grew, near Bangor. Sent me by the Lord Bishop of that Diocese.
f. 114†. Found in a Vein, along with the Iron-Ore. o. 90. in the Skrees, Cumberland.

f. 114*. In a Fissure of a naked Rock, Newlands, Cumberland.

f. 114++. A Shoot of Spar, hexagonal; with hexagonal Lines, one within another, at the Basis where ’twas parted from the Rock to which it grew; shewing the Order and Manner of the successive Application of the constituent Matter of every side of the Body at the same time, in its Formation. Found near the River Palmer, Cornwall.

CLASS VI. PART V.

Sect. IV.

Art. 2. Hexagonal Pyramidal Crystals, and Spars colour’d, Yellow, Red, Purple, Black.


f. 117. Others, with a Cast of Red, and in some Parts black, concreted on a Crust of Iron-Ore. From a Fissure in St. Vincent’s Rock, by Bristol.

f. 118. Others, with some of the Crystals Red, others Amethystine; concreted on a Crust of Iron-Ore, growing on the side of a perpendicular Fissure in St. Vincent’s Rock, Bristol. Those different Colours are owing to the different Proportions of ferreous Corpuscles uniting with the Crystalline in the Concretion.

f. 119. Others, white, transparent; but some of them with a very slight Tincture of Purple. From -- -- in Cumberland.

CLASS VI. PART V.

Sect. 5. Pyramids, some diaphanous, others colour’d, Hexagonal, join’d Base towards Base, by the Interposition of an hexagonal Column, adhering to Sand-Stone.

f. 120, 121. In these two the Crystals are very clear, and diaphanous, from an Iron-Vein or Fissure, in St. Vincent’s Rock, Bristol.

f. 123, 124. Two others, the Crystals little different from the preceding; out of an Iron-Vein, at Stainton, in Fourness.

f. 126. Another, with Iron-Ore adhering to it. Out of the same Vein. Some of these are ting’d red, by Iron Particles, concreting with the Crystalline, in the Formation of the Stone.

f. 127. Another, out of an Iron-Vein in St. Vincent’s Rock, Bristol. The Crystals in this are of a fine deep black Water.

f. 128. Another, the Crystals small, but very brilliant and fair; some of them white and pellucid, but much the greater number of
of a bright yellow; form'd on Iron-Ore. But the yellow Tincture, being owing to Lead, shews Particles of this Metal had incorporated with the Crystalline. Nor can that be thought strange in a Country where Lead-Ore is so frequent and obvious. 

f. x 128. Another, found in a perpendicular Fissure of a Stratum of Stone in Langron Iron-Mine, Cumberland.

CLASS VI. PART VI.

Spars, and Crystals, found loose, independent, and in Form of Nodules.

Sect. 1. Hexagonal sparry and crystalline Pyramids join'd Base towards Base by the Intervention of an Hexagonal Column, not adhering to any other Body, and without, what the Lapidaries call, a Root.

ARTICLE I.

Those that are single, and apart.


ARTICLE 2.

Those that are join'd, several in one Nodule.

f. 130. Many, join'd in a very fair Cluster, very bright and pellucid, King's Weston, Gloucestershire.

f. 131. 132. 133. Three Clutters, King-Weston. These have a Cast of Red.

Sect. 2. Echinated Crystalline and Sparry Balls:

PREFACE.

There are sometimes found in the Chalk-Pits of Kent and Surrey Pyrites thus echinated. See the 2d Addition of Native English Fossils. No. 1. & seq. Vid. etiam Pyritem ærosum subrotundum echinateum. Joh. Bauhini de Fonte Bollenfi, l. 4. p. 53.

f. 134. A Body of an orbicular Shape, thick set round, on all Parts of its Surface, with crystalline hexagonal Pyramids, Kings-Weston, Gloucestershire.

f. 135. Another, somewhat larger. Ibid.

f. 136. Another, scarce half so big. Ibid.

f. 137. Another. Ibid.

f. 139. Another, found on Plough'd Lands, upon Coteswold Hills near Ruscomb, Gloucestershire.

f. 141. Part of a large Cube of purple Spar, cover'd with a Cast of white, semi-pellucid, crystalliz'd Spar. From Cashbourn Lead-Mines, Cumberland.

f. 141*. Part of a less Cube, ting'd with yellow, and cover'd with a Cast of crystalliz'd Spar, very bright and sparkling; found in a Fissure among the Ore in that they call the Silver-Mine at Beer-Alston, Devonshire.

Sect. 3. Concave crystallin Balls: or Nodules with Spar and Crystal within them.

PREFACE.

Alonfo Barba of Metals, l. i. c. 15. mentions a sort of Stone in Paraguay and Buenos Ayres, lying 2 Fathom deep, which they call Coco's, because resemb'ling the Coco-Nut. They are hard, heavy, and about as big as a Man's Head. On the Inside of them grow Amethysts. These Coco-Stones seem to be of the same Sort with those of this Section.

f. 142. An orbicular Body, consisting of a ruddy sparkling Spar, full of large Pores. 'Tis of about the bigness of a Wallnut. From Flatholmns, an Island in the River Severn.

f. 143. A Piece of a much larger. From the same Place.

f. 144. A Piece of another, consisting of an outer Cast of ruddy tallowy Spar, and of blue, tallowy, foliaceous Spar, within. From Barry, on the West side of Severn, in Glamorganshire. There is a larger one of this kind upon the Top of the Cabinet. Copper concreting with Spar, and Crystal, imparts a blue to them. Of this there are Instances in the Veins of Copper-Ore.

f. 145. A Nodule, orbicular, near 3 Inches in Diameter, concave, the Cast without ferruginous, within Sparry, with a Cast of red, ½ of an Inch in Diameter, the inside lined with a crystalliz'd sparkling Spar. Found in a red Earth, in which was a Mixture of Iron, at Abson in Gloucestershire, not far from Bath.

f. 146. A Segment of a much larger, the Cast of a rust-like ferruginous Hue; the inside thick-set with large hexagonal crystalline Pyramids. There are several more of these upon the Cabinet. They are found of all Sizes to the Bigness of a Horse's-Head, in Clack-Mill-Field, at King's-Wesfion, Gloucestershire; two Foot deep in the Earth, over loose rubble Stones.

f. 147. 148, &c. to 176, inclusively, are Parts of like concave Nodules or Crystals broke out of them, to shew the various Crystalizations, the various Colours, and Sizes of the Crystals. All from the same Place.

f. 176*.
f. 176*. Spar, shot upon the Stone at the side of a perpendicular Fissure, 60 Foot deep, in Warren's Works, St. Nyois, Cornwall. The Root or Part that was next the Stone is white: the Tips of the Shoots all of an Amethystine Hue.

f. 177. A Topaz, or Shoot out of a Ball like the foregoing, cut and set into a Ring. Kings-Wellon, Gloucestershire.

f. 177*. Another Topaz. Out of a like Stone. From the same Place.

f. 178. Four Stones, cut and polish'd, out of a concave Ball from the same Place. They are of the Colour of the Amethyst.

f. 179. A Stone, crystalline, deep, and with a pretty good Water. It has a fine soft Amethystine Tincture; but not equal, and alike throughout. 'Tis cut and set in a gold Ring. Out of a like concave Ball. *ibid.*

CLASS VI. PART VII.

Spar of a strigated or ridged Form. Spar shot into the Shape of Erica or Heath.

Fluor Strigatus.
Fluor Ericaformis.

f. 181. This was Part of a Mafs of the Bigness of a Man's Head, and most of the Shoots were thus large. This and the 6 following were found amongst various other sorts of Spar, in a large Vein of Lead-Ore, about 30 Fathom deep, in one of Mr. Bathurst's Mines in Arkendale, Yorkshire. I never saw any of either the strigated or Erica-form, in any other Place. 'Tis heavy as indeed all the rest are, and doubtless hold one of the white Metals, Lead, Tin or Silver.

f. 182. *ibid.*

f. 183. There are some Sparks of Lead-Ore adhering to the Root of this. *ibid.*

f. 184. *ibid.*

f. 185. In this the strigated Spar is form'd upon the Tops of the Ericaformis; of which I saw several other Instances from this Mine.

f. 186. Fluor Ericaformis. *ibid.* This also is pondrous, and doubtless has Lead, or some other white Metals incorporated with it.

f. 187. Fluor Ericaformis, ponderous as the precedent. *ibid.*

Appendix to Class VI.

Vein-Stones, or Bodies consisting of Spar, earthy Stones, or other Matter ever of fine Constitution, found lodge'd in the Veins, or Perpendicular Fissures of the Strata along with the Ores of Metals and Minerals.

M 2
Of Earths, Umbres and Ochres, found in the Metallic Veins. vid Clafs 1.


VEIN-STONES.

† f. 1. A Mafs, white, with a Caft of Green, having externally a red Soil upon it very much resembling the Cornisb Steatites, only tis of the hardness of Alabaster. Out of a perpendicular Fissure in the Lead-Mines, Dunfell, Westmorland. Dr. Nicholson, Lord Bishop of Carlisle.

† f. 2. A stoney Mafs, grey, with a Caft of purple; having in it Spar purple and grey, Specks of a black Mineral, and some small Sparks of Lead-Ore. Out of a Fissure of the Lead-Mines of . . . . in Derbyshire, where tis called Toftan.

† f. 3. A dusky, grey, stoney Mafs, smooth and fine, much like the Shiver of the North. Found in the same Fissure with i. 40. near Buttermere in Cumberland.

† f. 4. A stoney Mafs, of a deep brown Colour, with a Caft of red. Found in a small Fissure, which is a String of the grand Vein in which the Wadd lies, in Borrowdale, Cumberland. The Place out of which this was taken was at the Distance of about 20 Foot from that Vein.

† f. 5. A Body porous and stringy, black with a Caft of red. Tis more ponderous, seeming to have something of Iron in it; otherwise, as to its Constitution, it exactly resembles the white Pumice found on the Top of Pico Teneriffe, being porous, and fibrous, and the Fibres woven with each other in the manner of that. From . . . . in Cornwall.

† f. 6. Another, of a pale rust Colour, with the Surface tuberous and uneven, porous and very light. Found in a perpendicular Fissure in a Quarry near Lanceglos, Cornwall.

† f. 7. A Pumice, black, light and porous, found in the same perpendicular Fissure with the precedent. This sort is frequently found at the Top of the Veins or Loads of Tin in Cornwall. It looks exactly like a Cynder or Scoria that has pass'd the Fire; and on one Side it has upon it a Cruft that appears as if it was vitriified. It very much resembles the black Pumice found in the Island of Teneriffe.

† f. 8. A Mafs, partly stoney and partly caukey, of a pale brown Colour. There is a Thread of Led-Ore runs through one part of it. Out of the same Vein in which the Shot-Lead-Ore, No 120. infra was found in Arkendale.

† f. 9. Another, part stoney, white, with Spots of black, part of white Spar. Out of a String, or small Fissure, of the Skrees, Cumberland. This has the Appearance of a Marble.

† † f. 10.
f. 10. Spar, white, with Veins of green, and some Spars of Marcasite. From Mr. Courtney's new Copper-Mine, in the Parish of Molland, near South-Molton, Devonshire. This seems to hold about 1/10 Copper.

f. 11. Spar, white, brown, and green, with some small Spars of Lead-Ore. From the Skrees, Cumberland.

CLASS VII.

Bituminous Fossils.

PART I.

Those that are of a more lax and coarse Constitution, and yield a grofter or Pitchy Matter when heated. 1. Lapis Piceus, or Pitch-Stone. 2. Lapis Ampelites, Obsidianus, or Canel. 3. Lithonthrax, or Coal.

PART II.

Those that are of a more dense, and fine Constitution, and yield an Oil.

Sect. i. Gagates Jet.

2. Electrum, Succinum, Amber.

CLASS VII.

Bituminous Fossils.

PART I.

Those that are of a more lax and coarse Constitution, and yield a grofter or Pitchy Matter when heated. Lapis Piceus, or Pitch-Stone. Lapis Ampelites, Obsidianus, or Canel. Lithonthrax, or Coal.

g. 1. Lapis Piceus, the Pitch-Stone; found near Bentel in Shropshire. Of this Stone, with the Method of extracting the Pitch forth of it, see Obs. relating to the Nat. Hist. of Minerals, p. 1. This I broke off a large Piece, that was flat, 3 Inches thick, and appear'd to have been part of a Stratum. Conf. r. 6, & 7. infra.

g. 2. A Bituminous Plate, compos'd of Crufts, alternately yellow and black, form'd by Water driveling and incrusting on the outside of the Gin-Pump of Mostyn Coal-pits. Flintshire.

g. 10. Coal, very black, fine and hard, so as to take a pretty good Polish. This is the Ampelites of the Shops, the Lapis Obsidianus of some late Writers, and is called Canal Coal at Haigh in M 3
Lancashire, where this was got. There are, in some small Figures of it, thin Plates of a greyish Spar.

\[ g. 15. \] Coal, from Benwell near Newcastle upon Tyne. There are in it Flakes of a shining, yellow, sulphurous Marcasite.†

The chief Ingredients of Coal are an Ochre and Bitumen. Conf. a. 77. supra g. * 20. infra.

\[ g. 16. \] A brown gritty Stone, with small Spangles of a white silvery Tale in it. From Bransby-Brow near Whitehaven. There are in the Cliff out of which this was taken several Layers of Coal and Stone of this sort lying alternately; and I observed a Termination of a Seam, as they call it in the North, or a Stratum of Coal, where it divided into several thin Plates, the Measure of the Aggregate of all which amounted to the whole thickness of the said Stratum. They pass’d on thus for about 7 or 8 Yards where most of them (for some broke off short, and did not pass quite through) run again into a Stratum of Coal of like Substance and the same thickness with the former. This Piece shews some thin Plates of the Coal in it, and I have underneath given a slight Adumbration or Sketch of the Thing as it was in the Cliff.

\[ g. 17. \] Coal, shatter’d and thick set with Veins of white Spar. From a Coal-pit at . . . . near Newcastle. See Samples of Coal from Farrington Pits, Somersetshire, with Veins of Spar, and Spar shot into Crystals, f. 108, & f. 109. supra.

CLASS VII. PART II.

Those that are of a more dense and fine Constitution, and yield an Oil.

Sect. I. Gagates, Jet.

\[ g. 30. \] A Piece of Jet, very fine and black, with Impressions of Ammonite upon it. || From Whitby, Yorkshire. This Body Pliny describes under the Name of Gagates, l. 26. c. 19. and perhaps again l. 27. c. 10. under the Name of Gemma Samothracia.

Samothracia insula ejusdem nominis gemmam dat nigrum, ac fine

† Sulphur is very frequent in Coal, that Fossil ever containing Bitumen, which is an Ingredient of Sulphur.

|| Upon the outsides of some Pieces I have observed Impressions of small Bivalves.
The Jet about Whitby lies in the Strata of Alum-Stone. They search for it chiefly in the Fronts of the Cliffs, as they are bared and beaten to pieces by the Sea. The Perfon that gave me this Account had been very inquisitive after it, and indeed has had the Monopoly of it for several Years. He had observed it from 1 to 10 Fathom in depth. As to the natural Form of it, 'tis generally flat; some of it round, lefscning towards the Edges, so as somewhat to resemble a Millstone: but 'tis most commonly oblong, and lefscning on each side towards the Edges, so as to carry some Resemblance of a Rib. This last splits lengthways, having Fibres directing their Course that way, in such manner as to constitute a Grain not unlike that of some Wood. The Jet is found in the Alum-Mines; as also in the very same Cliffs that the Amber is. Conf. g. 47. & seq. 'Tis also, like that, found beat forth by the Sea, and lodg'd upon the Shores. The Jet lies in the Alum-Stone sometimes flatways, sometimes edgeways. I have seen of it that has had a very hard sparly Matter in it.

I have by me a large Piece of Jet, from Whitby, 3 Inches and a half in thickness. Towards one side it becomes thinner, like g. 31. 'tis parted in two by a thin Vein or Plate of Vitriol, which liquated, being kept in a humid Place, so that the Mass parted into two. In the Parts next the Vein the Jet split easily into thin Plates, exactly resembling thole of Wood, and being of a like Grain and Texture.

g. 31. Jet of the Rib-like kind, Whitby. I have observ'd of this kind in Breadth from 1 Inch to 7, in Thickness in the Middle from $1\frac{1}{2}$ of an Inch to half a Foot. Nay I have seen four or five Pieces that were 8 or 9 Inches thick. I never saw any above two Foot in Length, but Mr. Jackson assures me, he has traced it for 8 or 9 Foot. It is usally freighted, but some I have seen inflected like a Rib. The two Edges are usually parallel, and the Body of equal Breadth in all Parts. It is also equally thick in the Middle for the whole Length.

g. 32. A Piece of Jet gradually thinning towards one Edge, Whitby Cliffs.

CLASS VII. PART II.

SECT. 2. Electrum, Succinum, Amber.

EXTRACT.

Amber a Nodule, invested with a Coat, call'd Rock-Amber, g. 47. 48.
The Coat being worn off by the Agitation of the Sea, 'tis called Washed Amber. g. 47.
Amber digg'd up at Land. g. 45.
——— found beaten by the Sea out of the Cliffs on the Shores; g. 40. & seq.

The Place where Amber is found.

Sheppey-Island, Kent. g. 40. 41. Clay-Pit, Richmond, Surrey. g. 45.
Coast of Norfolk. g. 42. Shores of —— Norfolk. g. 46.
From the Shores near Plimouth. Shores near Whitby, Yorkshire. g. 43.
On the Shores of —— Yorkshire. Shores near Yarmouth. g. 51.

A m b e r.

g. 40. 41. Two small Pieces of clear Amber found on the Shores of the Ile of Sheppey, Kent.
g. 42. Another, somewhat larger, found on the Coast of Norfolk.
g. 43. A small Ball, above half an Inch in Diameter, cut out of a Piece of fat or white Amber, and polish'd. Found on the Shores near Plimouth. This is that sort that is chiefly used in Medicine: and the Powers of Succinum præpar. Ol. Succini, & Sal succini volat. are sufficiently represented by the common Pharmacologists.
g. 44. An oval Plate, cut out of a Piece of clear Amber, about an Inch long, polish'd. Found on the Shores of —— in Yorkshire.
g. 45. Two Samples of Amber, brown and foul, found at least 30 Foot deep in the Pit where they dig Clay to make Tiles at Richmond in Surrey. The Workmen call it Rosin. There is in some pieces of it a Salt, that I take to be Vitriol; which starting and shooting, makes the Mass very apt to dissolve, and fall to Pieces, of which I have seen several Instances. Conf. g. 47. infra. One of these Samples being very little broken, and is cover'd with an exterior Crust, after the manner of all the true Nodules. Exposed to Fire, this sort burns, emits an Oil, and a Smell exactly like that of Amber, but exerts no electric attractive Power, when rubb'd and heated.
g. 46. A Piece of grey or fat Amber, from the Shores of —— Norfolk. Mr. Merrit. I saw a Piece of fat Amber, found on the Shores near —— in Kent, that weighed 47 Ounces, and was the most firm and free from Flaws, as well as the most beautiful I ever saw. The finest from Danzig was much inferior to it. Indeed I have seen several Pieces of Amber found in different Parts of England that much surpassed any I ever saw from Foreign Parts.
g. 47. Amber of a deep yellow, near brown; environ'd with a thick Crust of Amber, foul, brown, and very like that g. 45.* This Amber was found at the Foot of a Cliff on the Shores near Whitby, Yorkshire. The Person who gave me this, had been long enquiring into the Nature of this Body; and he is very positive, not only that all Amber is originally lodg'd in the Cliffs and Strata, and beat thence by the Agitation of the Sea, but that it is all, when first beat out, covered with a Crust, after the manner of Flints, and some other Fossils. And all that which is found naked, and uncovered, has had the Crust worn off by the successive Agitation of it upon the Shores by the Sea. This last the People who gather it here, call Wash'd-Amber; as they do the former, or crusted. Rock-Amber. Which they find ever near the Cliffs, and but just fresh beat forth, as they do the Wash'd-Amber more remote, and further out upon the Beaches and Shores, where it has been longer exposed and toss'd about. The same Person assured me he had several Times observed young Flies and Gnats, in Amber that he took up on these and the Scarborough Shores.‡

g. 48. White or fat Amber, covered with a coarse brown Crust. Found in a Cliff on the same Shores.

g. 49. Fat Amber, naked, also from the Shores of Whitby.

g. 50. Amber, very fine and clear, of a reddish yellow or flame Colour. From Whitby Shores.

g. 51. Amber, of a very bright yellow, with a Cast of red, having in the Body of it several Spangles, of a paler yellow, but wonderfully bright and shining. This was found on the Shores near Yarmouth. 'Tis turn'd and fitted up for the Head of a Cane, and is by much the most beautiful Piece of Amber I ever saw.

* These Masses, composed entirely of the coarse crusty Amber, bear some Analogy with those Nodules that are not uncommonly found in the Chalk-Pits of Kent, among the Flints; and are entirely composed of the same Matter of which the Crusts of those Flints are composed.

‡ The Amber is beat out of the same Cliffs that the Jet is.
CLASS VIII.

SALTS.

CLASS VIII. PART I.
The common Fossil Salt, which is of the same Nature with the Marine Salt, and the Fossils that contain it.

1. Two Pieces of transparent Rock-Salt; one white, the other red. From --- in Cheshire.

2. A pale brown Earth, with very small Micas in it. It has a saline Taste; and doubtless contains in it a marine Salt. Pigeons are continually picking at it. Thenford, Northamptonshire.


CLASS VIII. PART II.
The Fossils that contain Alum.


Aluminous Fossils.

4. Two Pieces of the Clay taken from the Vents of the fired Coal-pits at Fenham, near Newcastle. They are burnt to a Brick-like Substance, and have an aluminous Salt, sticking to them, that was sublimed and brought from beneath, by the Fire that pass'd forth at those Vents.

5. An aluminous Salt collected from the same Vents.

6. The common Alum-Stone, or Mineral wrought for Alum. 'Tis of a dark grey Colour, having in it numerous small shining Sparks. From the Duke of Buckingham's Works, near Whitby, Yorkshire.

7. Another, somewhat paler. Ibid.

8. Another, still rather paler. Ibid.

CLASS VIII. PART III.
The Fossils that contain Vitriol.

Properties of Vitriol, administered either internally, or externally. See the Medical Writers.

Vitriolic Fossils.

g.x 20. Native capillary Vitriol, of a green Colour, amalgamated into a Nodule about the bigness of a Nutmeg. From the Lead-Mine near Mam-Tor, in the Peak. Sir George Wheeler formerly shew'd me some of this sort found, in considerable Quantity, in sinking a Well, in a Common call'd the Road, near Chareing, betwixt Maidstone and Canterbury, in Kent. There were found likewise small Cornua Ammonis in a Stratum of Clay.

g.x 21. Native capillary Vitriol, of a pale brown Colour. From the Coal-pits at North-Byerly, Yorkshire. Mr. Fitz-Roberts.

g.x 22. Native capillary Vitriol, part white, and part green; also from a Lead-Mine near Mam-Tor, in the Peak.

g.x 23. Native Vitriol, capillary, part of a green, part of a pale brown Colour. From the Canal Coal-pits near Haigh, Lancashire.

CLASS VIII. PART IV.
The Fossils that contain Nitre.

Of the Method of boiling Earth for Saltpetre, and draining out the Salt. L. Erckern, l.y. c. 1. seqq.

Nitrous Fossils.

g.x 30. A brown, light, porous, friable Stone yielding Nitre. Mr. Jezreel Jones.

g.x 31. Another like Body from ---- in Denbighshire. 'Tis found, in vast Quantities, from five to fifteen Yards deep, for a hundred Yards in length, and near twenty in breadth. It lies to the Day, rake and coarse, i.e. in an Interval betwixt two Rocks; by which is, I suppose, meant a perpendicular Fissure.

CLASS VIII. APPENDIX I.
Sulphur.

PREFACE.

There is in the Earth a Salt which may fitly be call'd Sal acidum Fossil. This is the Basis of Sulphur, Alum, and Vitriol; the simple Salt, extracted out of any of these three indifferently, is the same: and is capable of constituting either of the other, with the Addition of a small Proportion of a Bituminous, Cretaceous, or Metallic Matter.

Sulphur is produced by only incorporating an oily or bituminous Matter with this Salt. Vid. g.15. supra.

Alum is produced by joining a cretaceous, or other like earthy Matter with it.

Vitriol,
(172)

Vitriol, by addition of a metallic Matter. If Iron be made use of, the Vitriol will be green; if Copper, blue.

Appendix II.
Arsenic.

g.*20. A Mineral, white, part in form of Dust, and part in small Masses. It appears to be chiefly Arsenic. 'Twas taken forth of the grand Vein of the Copper-Marcasit in Goldsculp, Cumberland. There was not much of it. What I observed, was sticking upon the Sides of the Vein, brought thither by the Water that drain'd in, and was perpetually dribbling, and dropping off from it.

CLASS IX.
METALLICO-SALSA.

Part I. Pyriteæ.

Preface.

The Pyrites has its Name from πῦρ, which denotes Fire. For, these Bodies holding Sulphur, such parts of this, as happen to be loosen'd upon striking fire, are immediately kindled, burn, and make an addition to the Spark. Which is the reason that the Pyriteæ, upon Elision, give fire much more plentifully than Flints, or other like Bodies, that have little or no Sulphur in them, ordinarily do. The Arab Naturalists express this Body in their Language by the Word Marcasit. For distinction sake, I have taken the liberty to call those that are independent, in form of Nodules, and lodge'd in Strata, Pyriteæ; and those that are found run in the Veins, or perpendicular Fissures, Marcasits.

Out of the Pyriteæ found plentifully on the Coasts of Essex, Kent, Suffolk, &c. which are beat out of the Cliffs by the Agitation of the Sea, and are as well found in digging accidentally in many of the Inland Parts of those Counties, is drawn that vast Quantity of Vitriol, made use of by Dyers in striking their Colours, by Refiners for making their Meftrura, and by Surgeons, Apothecaries, and other Artificers. In what Vitriol differs from Alum, I have shewn in its proper place. App. i. to Cl. 8.

The Pyriteæ of Kent and Essex, &c. yield, upon Tryal, a small Quantity of Gold and Silver; and some of them a little Copper. As to Iron, I have found some few that have yielded one eighth of that Metal. I could never perceive any Arsenic in the Pyriteæ; in which they differ from the Marcasits, most of which contain more or less of that Mineral.

EX-
Names vulgarly given to the Pyritae. Iron-Stones, b. 33. Fire-Stones, b. 34. Gold-Ore, b. 39. Horse-Gold, b. 4.

A dusky grey Pyrites, cover'd with a Crust, after the manner of other Nodules, b. 36.

Sea-shells in the Pyritae, b. 35.

Pyritae moulded in Shells, both turbinated and Bivalves; see the 2d Part of this Catalogue, of the extraneous Fossils.

Pyrite, found in a Stratum of Chalk, b. 6. 7. 11. 31.

— in a Stratum of Earth.

— in Shiver, b. 43.

— in the midst of a Stratum of Stone, b. 16.

— in Gravel, b. 17.

A Pyrites incorporated with a common black Flint, b. 21.

— having in its Centre a white semi-pellucid Spar, b. 1.

— having its Surface shot into Angular Figures, tending towards Cubes; with some Grains of Lead concreted with it, b. 1.


— with Septa, in manner of the Ludus Helmontij, b. 28. 29.

— form'd after the manner of the coralloid Aftroites, b. 4.

— form'd after the manner of the Aftroites coralloides undulatus, b. 20. 41.

I found small Pyritae in form of the common Fungi maritimæ coralloides, on the Coast of Sheppey-Island, Kent, e. 47. 48. supra. But they are since dissolved and fallen to pieces.

— of a tesselated or cubical Figure, b. 43. 44.

A Pyrites of a faint yellow, green, and blue, as holding some Admixture of Copper, b. 23.

— holding Copper, b. 65.

— of a yellow, shining, Brass-like Composition, b. 1. 8.

— of an Iron, or Rust-Colour, b. 3. & seq. 12. 23.

— brassy, with the Substance uniform, not striated, b. 1.

— brassy, striated from the Surface to the Axis, or Centre, b. 8. 11. 21. 30. 31.

— consisting of brassy shining Plates that break in Rhombs, b. 45.

PYRITES.

b. 1. A large round Pyrites of a very bright brass-like Appearance, beset with several Tubercles, these and the whole Surface being shot into angular Figures tending towards Cubes. There are several Grains of Lead scatter'd through the Body of it. Within 'tis of a shining greenish Yellow. The Substance uniform,
not striated. In the very Centre of the Ball is a Lump of white semi-pellucid Spar of the bigness of a Nutmeg. Mr. Flamsteed. From Derbishire. ['Tis perifh'd, and fallen to pieces; the Salt staring, and getting loose.]

b.2. Another less, of a Figure near oval, the Colour not fo bright. Found on the Isle of Greens, in the Mouth of the River Thames.

b.2*. Another, globular, the Tubera more depref'd, about an Inch in Diameter. 'Tis of a shining Copper-like Completion. Found on the Shores of Thanet-Island.

b.3. Another, the Surface of a Ruff-colour, rising into several grofs Tubercles. 'Tis of an oblong Figure, and, both in that, and the Bignefs, it nearly resembles the Kidney of a grown Calf. Be¬ing a little broken in that part, which anwers to the Pelvis, it appears within of a shining Brass-like Constitution. Found about 40 foot deep in the great Chalk-pit at Greenhythe, Kent.

b.4. Another, alfo of a Ruff-colour outwardly. 'Tis about 4 Inches long: of a cylindric Figure; but a little crook'd, and somewhat dwelling at each Extreme. At each end of it is a pretty large Cavity, in the middle, surrounded with several smaller, all striated after the manner of the marine and fossil Aldrites and FungiCoralloidei, from their Centre to their Circumference. Found in a Chalk-pit near Cherry-Hinton; where others of like Figure are frequently met with. The Workmen there call these Bodies Horse-Gold.

b.5. Another, of the fame Colour, two Inches long, and of a cylindric Figure. In the middle 'tis somewhat rough, but smoother at each end. At one end, in the very middle, is a small Apophy¬sis, or Stalk; on the other, likewise in the middle, a small Cavity, as if such a one had grown there too, tho' now broke off. From the same Chalk-pit.

b.6. Another, of the same Compleion and Figure, but a little thicker and shorter. At each end is a Stalk rising out of a small Cavity. Out of a Chalk-pit by Gravefend, Kent.

b.7. Another Pyrites, of the same shape, only a little crook'd; of a dusky Ruff-colour. Its Surface is thick set with small angular pointed Shoots. There are Vestigia of the Stalk at one end, tho' it be now wanting. Being broke at the other end, the interior Constitution appears, partly of a ruffy, and partly of a brassy Hue. 'Tis not striated. From the before-mention'd Chalk-pit, near Cherry-Hinton, by Cambridge.

b.8. Another Pyrites, little different in any refpect from b. 7. and 6. Being broken, its interior Constitution appears. 'Tis stri¬ated from the Surface towards the Axis of the Cylinder; and of a brassly Colour, with a purple Caft. I do not exactly remember where I found it; but 'twas in some of the Chalk-pits down the River, Thames.

b.9. Another, thicker somewhat than b.6. and little above an Inch long. In other refpects, 'tis little different, except that there are
are no Vestigia of Stalks at either end. From the Chalk-Pit near Cherry-Hinton.

b. 10. Another of a globose Shape, and bright rust Colour. 'Tis near two Inches in Diameter. The Surface rises into several round Tubercles pretty large, some of which are striated from the bottoms upwards. Out of a Chalk-Pit beyond Depsford, on the Entry of Black-Heath.

b. 11. Part of another of the same Shape and Bigness. Within 'tis of a brassy Hue, and striated from its Center to the Circumference. From a Chalk-pit, near Croydon, in Surrey.

b. 12. Another of an oval Figure, about an Inch in length. The Surface tuberous, and of a dusky rust Colour. From Norfolk.

b. 13. Another Pyrites of the same Colour, and tuberous in like manner. 'Tis globular, and near an Inch in Diameter. Found in Oxendon Fields, Northamptonshire. Mr. Morton.

b. 14. Another of near the same Shape and Complexion. The Surface of this is smoother, and finely shot into small angular Figures. Black-Heath, near Woolwich.

b. 15. Another also globular, its Surface very smooth and polite, of a dusky brown Colour near black. Found upon the plough’d Lands in Weekly Fields, Northamptonshire. Mr. Morton.

b. 16. Another of a roundish Form, a little broken. 'Tis throughout of a shining brassy Complexion. 'Twas found in the middle of a Stratum of Stone at Amble-side, Westmorland.

b. 17. Another of the same Constitution and Colour, only not so bright. Weston supra Welland, Northamptonshire. This was found in digging in Gravel.

b. 18. Another of a compres’d Figure, round: its Constitution and Colour like that of the immediately preceding Pyrites.

b. 19. Two small Pyrites, of irregular Figure, and an extreme bright Brass-like Complexion. The Surface shot into angular Figures. Sheppey-Island, Kent.

b. 20. A very curious Pyrites, of a brown Colour, with a slight shining brassy Glos. 'Tis near globular, and about an Inch in Diameter. Its Surface rising in an elegant manner into Ridges, undulated, and striated from their bottom to their top, very much like some sorts of the undulated coralline Affrtox. From the Shores of the Island of Sheppey, near Minster.

b. 21. Part of a Pyrites, striated from the Center to the Circumference, of a greenish brass-like Complexion, adhering to the common black Flint. Sheppey-Island, Kent.

b. 22. Another likewise flat, but larger. Externally 'tis of an Iron-Colour: within a faint green, blue, and yellow, with small brassy Sparks. Found near Weymouth.

b. 23. A Pyrites of a round, compres’d or lentincular Figure, and a dark brown Colour. 'Tis about an Inch in Diameter from Edge to Edge. 'Twas found on the Shores of the Island of Shep-
pet: where I have seen several others of like Figure, but generally less.

h. 25. A Pyrites of the same Colour and Shape, placed in the Cavity of another of an hemispheric Figure, in much the same manner as an Acorn in its Cup. From the same Shores.

h. 26. Another of an oblong Shape, about three Inches in Length, and one in Diameter. 'Tis of a ferruginous Colour, with some intermixture of a light brown. Its Surface rises into large Tubercles; and the whole is thick set with small pointed Studs. From the same Shores.

h. 27. A Pyrites of a rufh Colour, composed of several Tubera clustered together in an irregular manner. This is less ponderous than these Bodies usually are. From the plough'd Fields of Thorpe-Malfor, Northamptonshire. Mr. Morton.

h. 28. A light brown foney Body, with Veins of a dusky Pyrites running on the Surface and pervading the whole Substance of it, much after the manner of the Septa of the Ludus Helmontij. From the Shores of the Island of Skepney, Kent.

h. 29. Another like Body, the Veins disposed in a very beautiful and elegant Manner. From the same Shores.

A P P E N D I X.

h. 30. A Piece of a Pyrites of a pale rufh Colour, striated, or rather consisting of Fibres, tending from the Center to the Surface, and being of different Lengths, they render the Surface unequal; the longest joining, form pointed angular Bodies, with which 'tis studded in an elegant manner. Out of a Chalk-pit beyond Greenwich, Kent.

h. 31. A Pyrites of a deeper or redder Ruff-colour. This is somewhat bigger than a large Wallnut, in Figure near globular, only that its Surface is tuberous and unequal. Part of it being struck off, it appears to be striated within, its Striae tending from the Surface to the Center. Found in a Stratum of Chalk near 100 Foot deep, in the great Chalk-pit at Northfleet, Kent.

h. 32. Another, from the same Pit, less, otherwise not different, except that the Tubera on the Surface are generally angular, terminating in so many Points, and therein much resembling crystalized Bodies. Chalk-pit by Charlton, Kent.

h. 33. Another small one, oblong, and flat. 'Tis of a grey Colour, with a Coaf of Green: and thick set with small shining brafly Sparks. Found loose on the Shore near Scarborough Spaw. The Inhabitants call these Iron-stones.

h. 34. Another about two Inches long, and 1 ½ over. The Surface not so scabrous as h. 31. & 32. but pretty smooth, though rising in large Knobs. 'Tis of a brown Colour, but darker where 'tis worn: and has in some places Spots of white. Found ¼ of a Mile South of Outborn in Yorkshire, where these are call'd Fire-Stones.

h. 35.
Another of a dusky grey Colour, but in some Places shining and brafly. On the Surface of it is the Impression of a small Tellina: These and other Shells being here commonly found in these Bodies. It lay 40 Fathom deep, in Benwell-Coalery, about 2 Miles from Newcastle.

A Piece of a round Body. The whole was about three Inches in Diameter. 'Tis of a dark grey Colour, near black, and cover'd all over with a Crust \( \frac{1}{4} \) of an Inch thick of a lighter Colour. This Crust is in some Parts, both of its Surface and Mafs, thick set with small Parts of a shining brafly Appearance. Found by Hackness, not far from Scarborough.

A Pyrites, flat, having its Surface studded over with small Tubercles. 'Tis of a greenish Colour with a slight brafly Call. From the Brook at the North End of Wel福德, Northamptonshire. Mr. Morton.

Another of the same Colour, but somewhat more brafly and shining. The Surface rises in almost all parts into small angular Bodies, tending towards a cubical Figure. From Outhorn, Yorkshire.

Another, very small, of a grey Colour, with many Parts of a shining brafly Hue. From Spitton-Cliff, Yorkshire. The Inhabitants call this fort Gold-Ore.

A large Pyrites, very uncommon, and extraordinary. 'Tis covered with a Crust of a reddish Colour, and about \( \frac{1}{2} \) of an Inch thick. 'Tis broken, and its interior Substance appears elegantly variegated with a dark grey and a light brown, of which the former is the Ground, the other appearing partly in Spots and partly in irregular Veins. Each Colour is very distinct. There seems to be something of a resemblance between the Constitution of this Body and \( d. 19, 18 \). In the reddish Crust, and the neighbouring Parts, are several shining brafly Spangles. Found on the Shore near North-Shields, Northumberland.

A Pyrites, of a rust Colour, about the bigness of a common Sevil-Orange. Its Surface is very unequal, tuberous, and undulated not unlike the Brainstome, or the Acroites maritimus Coralloides undulatus of Boccone, Obf. Nat. p. 142. The Undulations are composed of thin Plates set by one another in much the same manner as in those Bodies. Some Part of its Surface is set with small Cubes. Where broken, it appears of a yellow shining Brass-like hue. From Beacon-Hill, in Wiltshire.

Another of a darker Colour, near round: and of the bigness of the largest Wall-nuts. Being broken, it appears to be striated within from the Surface towards the Center: with a white shining Metallic Appearance. This was found, at South-Sloke, near the River Thames; where they are common, and yield Vitriol.

A Pyrites of a rust Colour, cubic, and \( \frac{1}{2} \) of an Inch in Diameter. These are found commonly lodg'd in the Beds of Shiver, in Yorkshire, and Cumberland. This was found near Carlisle.
Another cubic Pyrites; larger than the former, and of an Iron-Colour. Found near Carlisle, Cumberland.

Part of a Pyrites, large, brassy, and shining; consisting of Plates that break into Rhomboid Figures. 'Tis covered over with a Crust, black within, without yellow, with a Coat of Red. Found near the Tin-Mine of Wheal-and-Coats-Luggon, Cornwall.

CLASS IX. PART II.

Marcajites.

PREFACE.

Of the Marcajite, see the Preface to Clafs IX. Part I. and to Clafs XI. Part I.

The Sulphurous Marcajites, and, in particular those call'd in Cornwall, Mundick, all hold Copper, more, or less. When that Metal is in such Quantity as to compensate the Pains and Charge of Working, the Mineralists call it not a Marcajite, but a Copper-Ore; of which there are some Instances in the following Clafs.

EXTRACT.

1. Of the Colour, and external Appearance of the Marcajites:

A Marcajite, cubic, yellow, shining, call'd by the Cornisb Miners Copper-Grains. i. 42.

Yellow, brassy, call'd in the Peak Brazil-Ore. i. 48.

Yellow, brassy, call'd by the Tinner of Cornwall, Mundick, and yellow Mundick, i. 15. 46.

of a whitish or pale yellow, call'd by the Cornisb Tinner, white Mundick. i. 22.*.

call'd in Cumberland, Grey-Ore. i. 24.

of a yellow, glossy, brassy-like Hue. i. 1, 9, 31, 36, 48, 52.

changeable, purple, blue and green. i. 10, 11, 17, 31, 38, 50, 51.

of a blueish Colour. i. 27, 37.

of a grey Colour, i. 22 *, 23, 24, 25.

2. Of the external Figures of the Marcajite.

A Marcajite shot into a cubic Figure. i. 1, 42.

shot into Grains. i. 4.

Small Grains of Marcajite, in an hard earthy Matter, grey with a Coat of Green. i. 14, 35, 45.

A Marcajite of a frigated or ridge'd Form. i. 41.

with botryoid Efflorescencies. i. 38.
3. Of the internal Texture of the Marcaftite.

Marcaftites, made up of thin Plates, laid one on another. i. 36, 38, 44.
—Fibrous, with a Grain like that of Wood. i. 26.
—of a plumose Texture. i. 57.

4. Of the Origin and Place of the Formation of Marcaftites.

Marcaftites, are all form'd in perpendicular Fissures. i. 38.
—in Veins in Canel-Coal. i. 12, 29.

5. Of the other Fossils incorporated with Marcaftites.

Marcaftite with black Tale, Mock-Lead, Blende, Galena inanis, or as the Cornifh Tanners call it, Tin-Glafs, i. 37, 48, 53, 54, 55, 56. Blende, will neither calcine nor melt; but abides the Fire, and all the Alkaline Fluxes. i. 56.

Marcaftites, having Spar incorporated with them. i. 19, 20, 21, 22, 22*, 29, 31, 35, 37, 38, 45, 48, 50, 53, 56.
—having with them Spar crystaliz'd. i. 35, 57.

A Marcaftite with red Crystals. i. 47.

Marcaftites, all of them hold more or less of Sulphur. i, 23, 24.
—holding Arfenic. i. 23, 24.
—probably yielding Bifmutth. i. 15, 22*, 25.
—with a greenifh Æruginous Matter. i. 34, 53.

Mundick yields fome Copper. i. 15, 22, 22*, 53.

A Tin Marcaftite. i. 49.

Marcaftites holding Tin. i. 51, 52.
—holding a little Lead. i. 33.
—with Lead-Ore. i. 47.
—with Iron-Ore. o. 99.
—with Bifmutth. i. 15, 16, 17, 23, 24, 25. Conf. i. 54, 55.
—with Selenites. d. 46.
—with Flints.
—with Asbeftos + d. 9.
—with Coal, g. 15.

M A R C A S I T EÆ.

i.1. A cubical Marcaftite, the Cube about ⅛ of an Inch in Diameter, and of a pale yellow Colour, with a metallick Glofs, and appearing like Brals. 'Twas found amongst others of like Figure, adhering to Slate-Stone in its Fissures at Keatmire, near Kendal. This has the Root or Mark of adhesion to the side of the Fissure, off which 'twas broke. The cubic Pyritæ, being found loose and independent, have not that Mark. Therein consists the difference. "Pyrites Coloris Aurichalcii, Figura quadrata, seu similis Tefforal." Aldrov. Muf. 1. 4. P. 574.
1. A Marcasite, of a bright Brafs-like Hue, crys-таллизирован в an
observing манер, the Angles and Sides irregular. From --- in
Cumberland.

2. A Marcasite of a deep yellow Colour, shot in some Parts,
into Grains which are confused, and their Figure irregular. Mine-
head, Somersetshire.

3. Another, much like the former. Minehead, Somersetshire.

4. A Marcasite, the Shoots of a bright Brassy yellow, confused,
but very fine, and tending towards a cubic Figure. Blosgason-Work,
Cornwall.

5. Another of like kind, but the Shoots of a changeable
Colour, between a purple, blueish and green. Blosgason-Work,
Cornwall.

6. Another, from the same Mine, and of the same sort, on-
ly the Colours in this are more vivid.

7. Veins, of Marcasite, pretty thick, and numerous, in a
Piece of Canel-Coal, from Haigh, Lancashire.

8. A Marcasite, the Shoots very pure and yellow. From a
Coal-Pit near --- in Somersetshire.

9. Another, the Grains lying in an hard Earthy Matter of
a greyish Colour with a greenish Cast. From --- Cornwall.

10. A Marcasite of a very pale yellow Cast, pretty free from
terrestrial Mixture, and by the manner of the Grain seems to hold
some small Proportion of Bismuth. Reedamore-Work, Cornwall.
This, and the following sorts, are of the same Nature with those
now wrought at the Copper-Works, in vast Quantity, with Sea-
Coal, at Redbrook in Gloucestershire. 'Tis found plentifully, in the
perpendicular Figures, all over Cornwall. It yields them from
1 in 14, to 1 in 24. To this, and most other Marcasites, they
give the Name of Mundie.

11. Another, equally fine, but of a much deeper yellow.
Chefwater, Cornwall.

12. Another, of the same Colour, with an Intermixture of
Purple. Ibid.

13. Another, of an high yellow Colour. From a Copper-
Mine at --- Cumberland.

14. Another, yellow, with a Cast of green, having inter-
mixed with it an equal Proportion of Spar. From --- near
Bristol. Mr. Southwell.

15. Another, of like sort, the Marcasite and Spar in near an
equal Proportion. Found in sinking a Sough-Pit at Haigh, Lan-
cashire.

16. A Marcasite, of a paler yellow Colour, with an Admix-
ture of white Spar; and, as it seems, of Iron. From a Fissure, some
some of the Stone adhering on each side of the Mafs. Out of a Lead-Mine, at Penrofe, Cornwall.

i. 22. Another of a pretty deep yellow, with a small Admixture of white Spar, and a hardish grey earthy Matter. From the Duke of Somerſet’s Works at Goldſcalp, Cumberland. This holds ½ Copper: and was out of the same Vein with l. 62. infra.

i. 22*. Another, grey, with an Appearance very like Bifmuth, and probably holding the Mineral. This is what they call white Mundick, in Cornwall. There is white Spar amongst it. It holds some Copper: and lay in the same Vein with the foregoing. Vide i. 25. infra.

i. 23. A grey Marcaſite, it consists chiefly of Sulphur, but holds a third Part of Arſenic, and perhaps a very little Copper and Bifmuth. From the Duke of Somerſet’s Works, call’d St. Thomas’s Works, near Goldſcalp, Cumberland.

i. 24. Another, very like the foregoing. It consists mainly of Sulphur and Arſenic, and seems to hold a little Bifmuth. The Miners call this Grey-Ore. From the Duke of Somerſet’s Works, at—— Cumberland.

i. 25. Another grey Marcaſite, like the two foregoing, only part of it is shot into Grain. From Kileſtre-Woold, in Cornwall. It seems also to hold Bifmuth. This sort is called there White Mundick.

i. 26. A Marcaſite, in Texture resembling the Grain of Wood, and so formed, as if two Pieces of Wood lay one a-croſs the other. The Marcaſite Grains are of a bright Yellow; but some of the Body is of a Black, the reſt of a Brick Colour. Found in finking a Well, near the Stables on Gogmagog-Hills, near Cambridge.

i. 27. A Marcaſite, pretty like that i. 22. supra, only it has a somewhat more blue Caſt. Found in finking a Well at Great Bowden, in Leicestershire; where ’tis found pretty plentifully, in most of the Wells they dig thereabouts.

i. 28. A yellow Marcaſite, with a blackish Admixture. From the Copper-Mines of ——— Cumberland.

i. 29. A Piece of Coal, with fine white Spar, and a yellow shining Brassy Marcaſite intermingled with it. Taken out of a Dyke in Sir William Blacket’s Coaſtery, Newcastle.

i. 30. A Marcaſite, flat, and equally thick in all parts, as if it had fill’d a Fiffure. ’Tis about an Inch in thickneſs. The two opposite Surfaces are very black; within ’tis grey, with many Sparks of a yellow. From ——— on Mendip, in Somersetshire.

i. 32. A Piece of Marcaſite, of a deep yellow shining Gold Coľour, except some small Parts, which are of a shining Red or Purple, and a little Mixture of white Spar. It seems to hold a very small Proportion of Copper. From Mr. Courtney’s new Copper-Mine, in the Parifh of Malland, near South Molten, Devonshire. This is one sort of their Mundick.
I.33. Another, little different, only not of a yellow quite so deep, with the Spar in greater Proportion, and part of it crys-

talliz'd. From Nancy-keag Downs in Cornwall. Mr. Baffet.

I.34. A Marcafite of the fame Colour with the precedent, but somewhat more bright and shining. On the Surface of it ad-

heres a small Quantity of a green seruginous Matter. From Cor-

beck, Cumberland.

I.35. A large Marcafite, consisting of Braffy and Sparry Grains, 

near equally mix'd in all parts. Sent by the Name of Treleath-

Ore. From Cornwall. Mr. Baffet.

I.36. A Marcafite of a very fine Braffy Hue. It appears to be 

made up of thin Plates laid one upon another. The Matter of it 

is very pure and free from any Mixture. The Surface is polite. 
'

'Tis angular, as if crysailiz'd. From Benwoll-Coalety, Newcastle.

I.37. Another, with Spots very shining and bright, someblueifh, 

others of a Copper Colour. Amongt the rest is a white Spar: 

and a black glossy Matter like Talc. This sort of Matter is com-

mon in Cornwall: and call'd there Mock-Lead. 'Twill not run in 

the Fire with any Alkaline Flux: nor will it calcine. Poldice-Work, 

Guinnop, Cornwall.

I.38. A Marcafite, with white Spar on the Parts that grew to 

the Sides of the perpendicular Fiffure from which 'twas separa-

ted. The Outside is thick fet with botryoid Efflorescencies, or small 

Knobs, yellow, blueifh, and purple; all of a shining metallic Hue: 

and compos'd of little Flakes or Plates; the whole being a very 

observable and beautiful Body. This was part of the Dead,

as the Tinners call the Part of the Vein that they judge not worth 

working. From the Tin-Mine of Wheal-and-Coats-Luggon, Corn-

wall.

I.39. Another, from a like Fiffure: and of a Constitution little 

different. From Poldice-Work, in Guinnop, Cornwall. Dr. Coamar.

I.40. A Vein-Stone, of a dark grey Colour; the Mafs thick 

set throughout with extremely small cubic braffy Marcafites, out 

of a perpendicular Fiffure of a Rock by Buttermere, a Lake where 

Charts are taken plentifully, in Cumberland.

I.41. A Mundick Grain, fine, shining like Brafs, half an Inch 

in Thickness, and terminating in an Edge like a Wedge; much 

like the Spar from the Lead-Mines of Arkendale. f 181. & seq. 

This was sent by the Name of Gold-Ore, from the Gold-Mine of 

Mr. Forthskue, at Coppole-Tar, Devonshire.

I.42. A large cubic Marcafite, with a blueifh Stoney Matter ad-

hering to one Part of it. From Vellan-Greas-Work, Cornwall. 

The Miners call it Copper-Grains.

I.43. Mundick Grains of several Sizes, and shot into several Fi-

tures; lodg'd part of them in a blueifh grey, and part in a brown 

Stone. From the fame Work.

I.44. A Marcafite, very fine, yellow and braffy in one Part; 

composed of Plates, breaking with a Grain exactly like the Roch-
Akim from Italy, in the Catalogue of the Exotic Fossils, p. 183.

From the Copper-Mine at Hinlton, Cornwall.

1. 45. Small Mundick Grains, yellow; thick set in a grey Mafs, with a little white Spar. From St. Columb, Cornwall.

1. 46. The common yellow Mundick. From the same Mine.

1. 47. A Marcafinite, of a greenish yellow Caft, with some Grains of a Matter very like Lead-Ore: and two small hexagonal pointed Crystallizations, red, and much like Granats. From Cornwall.

1. 48. A Marcafinite, of a fine Brafs-like shining Appearance, crystalliz'd; with an Admixture of white Spar, and Mock-Lead. This the Miners call Brasile Ore. From Worksworth in the Peak. Upon its lying by some time, a very yellow fulphurous Duit proceeds forth of it in several Parts.

1. 49. A Tin-Marcafinite of a dusky Colour, near black, with a Caft of green and yellow. Carenbry, Cornwall. Mr. Baffet.

1. 50. Another, Part of a brafsy shining yellow, Part blueish and purple; with white Spar. Trevasca, Cornwall. Mr. Baffet.

1. 51. Another, little different, only the blue and purple Colours are here more bright and fine. It holds a little Copper, and Tin. Poldice, Cornwall. Mr. Baffet.

1. 52. Another Tin-Marcafinite, with yellow Mundick, but the greater Part of it of a dusky blue Colour. Relifian, Cornwall. Mr. Baffet.

1. 53. A Lead-Marcafinite, being a mineral Mafs, flaky, glossy, and breaking in Angles; much like the Potters Lead-Ore, only tis of a Colour more dusky, and tending to black. The Miners call this Mock-Ore, Mock-Lead, Wild-Lead, and Blinde: Agricola, Galana inanis: the German Mineralists, Blende. There are in it Veins of a yellow shining Marcafinite; with a little white Spar: and on one side a greenish Æruginous Matter. Upon tryal of a Piece of this Body in the Fire, it yielded a very little Copper, Iefs Lead, and no Tin. The Blinde is very obstinate. Several Attempts have been made with the Alkaline Fluxes to run this, but in vain. Godolphin-Ball, Cornwall.

1. 54. Another like Mafs, sent by the Name of Tin-Glafs. Found in a Drift-Work 50 Foot deep, near Castlock, Cornwall.

1. 55. Another, sent also by the Name of Tin-Glafs. Found about 20 Fathoms deep at St. Stephen's, in Branwell, Cornwall.

1. 56. Another Mafs of Mock-Lead, very ponderous, black, bright, and shining, with white Spar, but no yellow Marcafinite. From a Tin-Mine in Wythell, Cornwall. There are vast Quantities of this Mineral in several Parts of that County. Many Tryals have been made of it; but it can neither be brought to calcine, nor run in the Fire.

1. 57. A Mafs compos'd alternately of Veins of white crystalliz'd Spar, and a black glossy shining Matter, seeming to be Mock-Lead. The Texture of the Veins of this Mafs is very remarkable; it being compos'd of two Orders of Fibres, meeting
in an acute Angle in the middle of the Vein, and composing a
Body not unlike a Feather. Found in a perpendicular Fissure near
Caudbeck in Cumberland. I have seen, in the Mendip-Mines, Man-
ganese, nearly resembling the black Part of this Mass, incorpora-
ted with the sparry Lead-Ore, as like the white Part of this
Mass.

CLASS X.
Metallic Minerals.

Mineral Bodies that approach somewhat the Nature of Metals; and,
like them, run in the Fire to a Regulus; but not malleable; wherein it differs from the Regulus of Metals.

PART I. Antimony.
II. Calamin.
III. Black-Lead.

CLASS X. Part I. Antimony.

This is one of the most powerful Simples of our Dispensatories.

k.1. Ore of Antimony, from ---- in Flintshire. 'Tis found
near the Day.

k.2. Another Sample, from ---- in Cornwall. 'Tis not so
rich as the former. Mr. Kemp.

k.3. A pretty large Mass of Antimony, crustated over with a
brown flakey sulphurous Matter, with some Grains of Spar in it:
Barbary-Work, Cornwall.

k.4. Antimony, part of it in Striae, and Part in Sparks, coated
all over with a sulphurous Crust of a pale brown Colour. Found
plentifully 24 Foot deep in a Mine at Howson, in St. Stephen's,
Cornwall.

k.5. Part of another, finer, from the same Mine.

k.6. Antimony-Ore. From St. Anstil's Mine, Cornwall.
Mr. Scobell.

CLASS X. Part II. Calamin.

This is in frequent use amongst the Surgeons, in Plaisters,
Ointments, and Collyria.

k ii. Lapis Calaminaris, externally of a Rust Colour: with-
in of a dusky green, got near Blagen upon Mendip. 'Tis found
in the perpendicular Intervals. They meet with it at the Depth of
of about 3 Fathom. This was out of a perpendicular Interval. There is a little Spar in it: and some few small Sparks of Lead-Ore.

k. 12. Another Sample, of a paler Colour. From the same Mine.

k. 13. Another Sample of Lapis Calaminaris, with some Spots of a deep red, and others of a Straw Colour. The latter only is Calamin. Mendip, Somersetshire.

k. 14. Another Sample, little different from that k. 12. Only on one Part are three Plates, each about \( \frac{1}{10} \) of an Inch in Thickness, of a somewhat deeper and browner Colour, and of a harder and closer Consistence. They are placed one over another; with a small Interval, of about \( \frac{1}{10} \) or \( \frac{1}{12} \) of an Inch betwixt each, which consists of a very pale yellow Matter, and is much more florid and porous than that of the Plates. This last is the Calamin. Mendip.

k. 15. A piece of Lapis Calaminaris, of a light brown Colour, friable, and thick set with small Pores. There is in it a pretty large Vein of white Spar, having several Grains of Lead-Ore, of the Potters-kind, in it. Mendip. This holds a very small Proportion of Calamin. What there is, of this Mineral, in the Mass, is of a Straw-Colour, and porous.

k. 16. A Lump of Lead-Ore; coated over with a very thin Coat of Calamin, Part of it of a reddish, and Part of a dusky Green. From Mendip, Somersetshire.

Class X. Part III.

Nigrica Fabrilis Merreti. Black-Lead, or Wadd.

See the Account of this Mineral, and the several Uses of it, in the Observations relating to the Nat. History of Minerals, p. 2.

This Mineral is sometimes found in the Veins of Copper. Vide l. 59. infra.

\( k. 1. \) A Mafs of Black-Lead, of the very finest sort; from the Mines in Barrowdale, 6 Miles from Keswick, in Cumberland.

\( k. 2. \) Another Mafs, coarser, run in some Parts of it into angular Figures. From the same Vein: as are likewise all that follow.

\( k. 3. \) Another, with Stoney Matter, Part of it grey, Part greenish, and Part of a Russet-Colour, incorporated with it. There are also in it two Lumps, or Knots, of Black-Lead, both very fine. Ibid.

\( k. 4. \) Another Mafs, very fine; with a reddish Stoney Matter adhering to it. Ibid.

\( k. 5. \) Another, with white Spar incorporated with it. Ibid.

\( k. 6. \) Another, with a Vein of Spar in it, Part of it white, and Part red. Ibid.
The Introduction to the following Classes.

Of Metals in general.


These one main Fund of our Trade, and Riches, our Strength and Power, by Sea and Land.

Late Discoveries of metallic and mineral Bodies.

And Improvements of the Art of ordering, separating, and refining of them.

Considerable Defects yet remaining in the present Methods of smelting and managing of Ores.

As likewise in the Natural History and Knowledge of them.

Fossils, of little Value or Consideration, work'd in several Parts of the Kingdom.

Whilst others of great Importance are neglected: and their Worth not known.

Methods of remedying this.

The Design of the present Papers: and of the Discourse concerning Mining, and that concerning Assaying.

The Use and Advantage of metallic and mineral Studies to the Publick.

C. 2. Of the Steadiness and Constancy of Nature in all its Productions: and in the Formation of all Bodies.

This happens, 1o. from the Constancy of the Procedure of the Agents that are instrumental to the Formation of those Bodies: And, 2o. from the Unalterableness of the Corpuscles, which serve for the constituting and composing of those Bodies.

All Gold, when equally pure, and freed from extraneous Matter, is absolutely alike in Colour, Consistence, Specific Gravity, and all other respects; the Corpuscles which constitute that Body being perfectly uniform and homogeneous.

The same holds in Silver, Iron, and all other Metals: as likewise in all the simple Minerals, particularly Talc, and Crystal; which are found incorporated with all the several kinds of Metals, much more frequently than any other Bodies besides in all the whole mineral Kingdom.
Sec. 1. Of the Fibrous Tale. Class IV. Part III.

This Body generally holds to its fibrous Texture with what other Matter ever it happens to be incorporated, unless that Matter be superior to it in Proportion very greatly indeed.

Of the Hematites, and Schijlos. The Tale in these Bodies keeps to its fibrous Texture, tho' they hold 10 or 12 Parts in 20 of Iron. Compare the English fibrous Tale, $4. d. 1$. with the Hematites, o. 74.

So also in the green, crusty, fibrous, talky Copper-Ore. This yields 5 Parts in 8, of Copper. $l. 45, 46$.

Likewise the fibrous Talky Lead-Ores, $n. 56$. & $n. 75$. & seq. yield $\frac{3}{7}$ of Lead.

Metal discover'd in these Bodies by its Gravity.

The particular Species of Metal, by its Colour, Hue, and Complexion.

The fibrous talky Iron-Ores all red.

The fibrous talky Copper-Ores all green.

The fibrous talky Lead-Ore white, $n. 75$. or yellow, $n. 54$.

56, 57.

Of the fibrous Constitution of some of the Pyritæ and Marcafitses.

Of the fibrous Constitution of Antimony.

Of the fibrous Constitution of some Cinnabar.

Of the fibrous Constitution of the Asbestos.

Of the fibrous talky Spars.

Of the fibrous, talky, sparry Plates of some of the corneous Flints, c. 263. & seq.

Of the fibrous, talky, sparry Plates of the Ludus Helmontij.

Of the fibrous, talky, sparry Pipes of the Lapis Syringoides.

Of the fibrous, talky, sparry Crusts of some of the Stalætis.

Of the fibrous, talky, sparry Constitution of the Stelechites, and some others of the Fossil Corals.

Of the fibrous, talky, sparry Cones of the Belemnites.

Of the fibrous, talky, sparry Plates form'd out of the Water of the Springs in and about London, upon the Evaporation of the Water: particularly in the common Tea-Boilers.

Appendix.

Of the fibrous, talky, sparry Crufts of several Concretions in animal Bodies: particularly of the Bezoar.

Of the fibrous, talky, sparry Crufts of the Stone of the Vesica Fellea.

As also of the Stone of the Kidneys.

And of the Stone in the Vesica Urinaria.

Of the fibrous Constitution of some of the factitious Vermillions.

Sec. 2. Of Cinnabar of Antimony. o. 42.

Of Crystals and Spars. These are found incorporated with Metals of all sorts, much the most commonly of any Fossils whatever.
The four grand Tests, or Criteria of Metals, incorporated with, or contained in Spar or Crystal: 1. The specific Gravity of the Body. 2. Its Texture. 3. Its Figure. 4. Its Colour.

§. 1. The specific Gravity of Spars of various sorts.

The specific Gravity of Crystal.

All Sparry and Crystalline Bodies, that surpass that Standard in specific Gravity, hold Metal.

§. 2. As to the Texture or Grain, and interior Constitution of Crystal, 'tis irregular: and breaks uncertainly. But when incorporated with the fibrous Talcs, it shews, if broke, a striated or fibrous Texture, like that of those Talcs; of which, more above.

When it breaks into angulated Pieces or Figures, e.gr. Cubic, or rather inclining to Rhomboid; 'tis disposed to that Texture by Lead that is incorporated with it. And such Crystal, or Spar, is frequently found in the Veins along with the Lead-Ore: particularly in the Lead-Mines near Workswork. Vide f. 25. This is in specific Gravity to Water, as 2 44 to 1; whereas pure Crystal is but as 2 1 2 at the most. This shews that there is an Admixture of extraneous Matter in it: and several Experiments I have made upon it, prove that Matter to be Lead. e.gr. Dissolv'd in Acids, it gives a Sweetness to the Menstruum exactly like that imparted by Saccharum Saturni, dissolv'd in like manner. And, by Tryals in the Fire, I have obtain'd some small Quantity of Lead out of it.

A Spar very common in Lead-Mines, that is flattery, and breaks in Squares, exactly like the finest Pottern-Lead-Ore.

§. 3. As to the exterior Form of Crystal, when pure, 'tis found shot only into a pyramidal Figure: or into a Pyramid erected upon a Column; each with six Sides, and Angles.

Whenever it recedes from that Figure, the Variation is caused by the Admixture of some extraneous Matter, either mineral, or metallic.

Metallic Matter, when pure and simple, never shoots into an angulated Figure: nor is indeed capable of doing that.

The Bodies that, incorporated with Metals, dispose them to shoot into angulated Figures, are either, 1. Sulphur; or, 2. Crystal. And all Fossils that are angulated, or shot, have more or less of one or other of those Minerals in them, n. 132.

1. There is ever Sulphur in the tessellated Pyrites, and the angulated Marcasites; neither of which indeed ever hold any considerable Quantity of Metal.

2. But Spar and Crystal are infinitely more obvious and common: and found more or less incorporated with the Metals of most Mines in the World.

Where the Crystalline Matter prevails, and is superior in Quantity to the Metallic, the Body is more or less pellucid; answerable to the greater or lesser Proportion of the Crystal.
But, when the metallic Matter is superior, the Body is in course opaque. Instances, in the Tin Grains - - - the tessellated Lead - - - and the Iron Rhombs.

Where there is metallic Matter, incorporated with the Crystalline, it frequently causes this to recede from its natural hexagonal Figure, and to assume one different, answerable to the Figure and Disposition of the Parts of the particular Metal incorporating with the Crystal in its Concretion.

Iron, incorporated with Crystal, determines the Body to shoot into a Rhomboid Figure, o. 19.

Tin, incorporated with Crystal, disposes it to shoot into a quadrilateral Pyramid, sometimes placed on a quadrilateral Base, or Column, m. 1. m. 6.

Lead determines it to a Cubick or a Parallelipiped Figure.

The specific Gravity of the pure, pyramidal, or prig Crystal, 2 1/2: 2 1/2.

The specific Gravity of the Cubick Crystal, f. 88. is 3 1/5.

Tryals of the Cubick Crystals by acid Menstrua: and by Fire, evincing that they hold Lead.

The diced Crystals, f. 87. *88. 89. & *141. have all a Cast, more or less, of yellow, the Colour imparted to Crystal by Lead, when incorporated with it. Confer. §. 4. infra.

The Cubick Crystals are found in the Veins along with the Lead-Ore, in the Lead-Mines of Westmorland, Arkendale in Yorkshire, &c.

Sometimes where the Lead is not sufficient in Quantity to obscure the Body, and render it opaque, yet it is capable of determining it to a Cubick Figure.

The same Crystal, holding Metals of different kinds, may be disposed by the one to a particular Figure, and by the other to a particular Colour, Instances of Lead and Iron, in the tessellated purple Crystals, f. 91. & seq.

Different Metals, or Metals and Minerals, incorporated with Crystal in the same Body, give it a Figure somewhat compounded and irregular. Of this there is an Instance in f. 93 †, in which all the Crystals that hold Lead are yellowish, and of a cubic or parallelipiped Figure; whereas those that are green, and hold Lead and Copper, recede from that, and are of an irregular Figure.

§. 4. Of the various Colours observable in Crystals.

These arise from an Admixture of some extraneous Mineral, or metallic Matter, but much more commonly the latter, incorporating with the Body in its Formation.

All the Gems owe their Colours to an Admixture of such extraneous Matter, chiefly metallic, with the crystalline.

They are found either in form of Nodules, reposited in the Bodies of the Strata; or else cristallized in the Fissures or perpendicular Intervals of those Strata.
The Nodules are either, 1. Solid, and of Figures wholly irregular and uncertain like Pebbles. 2. Solid, and round, with their external Surfaces beset all over with crystallized Gems. 3. Concave, having their inner Surfaces beset with like crystallized Gems. 4. In Rhomboid Figures. 5. In form of Columns, with several Sides, generally six, terminating at each end in a Point.
The Gems in form of Nodules were form’d during the time of the Deluge, along with all other metallic and mineral Nodules. Those in the perpendicular Fissures are form’d and grow there like the Crystals and Spars; and were form’d by the same means.
The Nodules were sustain’d amidst metallic and mineral Matter during their Formation; and the Gems in the Fissures have frequently Minerals and Ores of Metals accompanying them.
The black Stones and Gems owe their Colour to Tin, m. 1.
The red Stones and Gems owe their Colour to Iron; and are found chiefly in Iron Mines, or along with the Ores of that Metal.

Stalactite of a red Spar in the Veins of Iron-Ore, f. 66. 67.
Red Crystal and Spar in Iron-Ore, o. 28. 55. 59. 60. 61. 98.
The Bristol Stones have frequently a Tincture of red.

I observ’d in St. Vincent’s-Rock, by that City, some Stones that nearly approach’d the Granate Complexion; and several very nearly resembling the Amethyst. That, and indeed most of the Rocks thereabouts, are of a red Hue; and impregnated with Iron. And indeed most of the Bristol Stones, particularly the red, I found actually growing along with Iron-Ore in the Veins and Fissures of those Rocks.

Of the Granate, i. 47. f. 0. 2.
Of the Ruby.
Of the Amethyst, f. 80.
The green and blue Stones owe those Colours to an Admixture of Copper. That Metal, dissolv’d, and incorporated with an Acid, assumes a green Colour; with an Alcali, a blue, l. 53.
Spar, white, tinged with green, yielding ½ Copper, f. 15.
Crystal, Part pellucid, and Part tinged throughout with green, along with Copper-Ore, l. 53.
Crystal and Spar of a green Colour from Veins of Copper-Ore, f. 15. 15. 16. 93 f.
Of the Emerald, l. 53.
Copper-Ore, of a green Colour, very frequent.
Of Àrugo, or Verdigreafe.
Of the green Rust of Brass, and of Copper.
Copper-Ore of a blue Colour.
Of the Saphir, l. 53. 54.
Blue Spar, f. 16. 16.
The yellow Gems owe that Colour to an Admixture of Lead.
Of Litharge.
Of Saccharum Saturni.
Of Vitrum Saturni, p. 505. 0. 12.
A Calx of Lead, Minium, or Litharge, run down and flux'd with a triple proportion of crystalline Pebles, or Sand, constitutes a Glafs transparent and yellow.

The Specific Gravity of Vitrum Saturni.
The Specific Gravity of the Topaz.

Of the Topaz, its Colour and Constitution, \( f. 128.177.177^* \).

A yellow cubic Crystal from a Vein of Lead-Ore, \( f. 141^* \).

Of a sort of Lead-Ore, of a greenish yellow Colour, from Mende...

APPENDIX.

Of the different Hardness of the various kinds of Gems. This chiefly happens from the different Hardness of the crystalline Material, which is the Basis or main Ingredient of them.

That Matter seems to be of three sorts. 1. The Common Crystal, which appears to be the Basis of the Occidental Topaz, Amethyst, and Saphir; of the Opal, the Chrysolite, the Aque Marine, the Chalcedony, the Jacinth, the Vermilion; of the Nephritic Stone, the Jasper, and the Heliotropium; of the Cornelion, the Beryl, the Agat, the Cat's Eye, the Onyx, the Sardonyx, and the Moco Stone.

2. Another Species of Crystalline Matter, many degrees harder than the common Crystal, and usually call'd the White Saphir. This is the Basis of the Granate, the Oriental Topaz, the Amethyst, the Ruby, and Saphir.

3. The Adamantine Crystal, or constituent Matter of the Diamond. Even this likewise admits of a metallic Admixture; and is sometimes observ'd with a yellow Tincture, as also, tho' much more rarely, with a green, red, or blue.

The Hardness of several of the Bodies of the first Class is much augmented by the Incorporation of the additional Matter. Thus the Jasper, Heliotropium, and Agat, are four times as hard as Crystal, which is the Basis of those Stones.

But the Hardness of some of the Bodies of the second Class is diminish'd by the additional Matter; and the Oriental Granate, Topaz, and Amethyst, are not so hard as the white Saphir.

Of the Specific Gravity of Crystal, the white Saphir, and Diamond; as also of the various kinds of colour'd Gems.

The Refraction of Crystal, the white Saphir, the Diamond; and the several kinds of transparent colour'd Stones.

Of the various sorts of colour'd Glasses, Pastes, Enamels, and factitious Gems.

A Recapitulation, with the several Canons or Rules of the Art of judging of the Constitution, and the mineral or metallic Contents, of any Body; founded upon the Specific Gravity, the Texture, Figure, and Colour of it.

Metal, of the same sort, has ever the same Properties, and is alike in all respects, in what part of the World it is got, or
in whatever Matter it is found, when it is difengaged from that Matter, and brought to be equally pure, and free from extraneous Mixture.

CLASS XI. PART I.

The Ores of Copper.

PREFACE.

Copper is found incorporated with very various Matter; in particular with the Sand (l. i. & seq.) of the Stoney Strata; with the Matter of the Lapideous Nodules; with Sulphur, or other Minerals; with Spar; and with Earth. Where the Copper is predominant, and in such Quantity as to be worth working, I have ranged the Body amongst the Copper Ores; but, where the other Matter is superior, I have ranged it under the proper Head of that Matter. Of this there are Instances in the Marcasites and the Pyrite; (l. 15. 16. 17. 23. 32. 51. 53.) in the Spars and Crystals that are tinged with blue and with green (f. 16. 93.) in the poorer Lapis Armenus (a. 52.) and Terre Verte (a. 53.) and finally, in the Tin and Lead Ores (n. 104.)

The EXTRACT.

Steel-grain’d Copper-Ore. l. 42.
Copper-Ore of a dusky brown Colour, near black, l. 63;
— glossy, purple, l. 64.
— red, with a Coat of Purple, l. 38.
— friable, seruginous, green, l. 16†.
— friable, with a green villose Coat, l. 47.
— with a hard, green, seruginous Crust, striated a-crofs, or having transverse Fibres, in manner of the Lapis Hamatites, l. 45.
— with fibrous talky Concretions, green, l. 19. 38.
— vein’d with blue and green, l. 55. 59.
— green, blue, and black, l. 16*. 18. 22. 37.
— blue, or Lapis Armenus, l. 26. 27. 28. 29.
— with Spar, white, green, and blue, l. 9. 10. 11. 12. 13*. 14. 17. 24. 35.
— green, with green Crystals, l. 16. 53.
— blue, with blue Crystals, l. 25. 54.
Copper dissolv’d with a volatile Alkali, takes a blue; with an Acid, a green, l. 53.
— blue, with white fibrous Lead-Ore, l. 28.
Copper-Ore with Potter’s Lead-Ore, l. 5. 8. 35.
— with Tin-Ore, l. 22.
— with Iron-Ore, l. 18. 19. 38.
— with Marcasite, l. 16*. 18. 22. 37.
Mundick, holding Copper, with white Spar, l. 61.
Copper-Ore, with Wadd or black Lead, l. 59.

— in the Mafs of Sand-Stone, l. 1. 2. 3. 4.
— Virgin or Native Copper, l. 30. 31. 32. 33. 48. 50. 51.
— with Bits of white Spar in it, l. 49.

Green Ore yielding \( \frac{1}{2} \) Copper, l. 25.

— yielding \( \frac{3}{2} \) Copper, l. 46.
— blue, yielding \( \frac{1}{2} \) Copper, l. 26 to 29.

Æruginous, friable, green Ore, \( \frac{1}{2} \) Copper, l. 16.

Copper-Ores.

1. A gritty Sand-Stone with a white Peble in it, 'tis tinged with a green Colour. White Pebles are frequently found in it, and some near pellucid. There is a little Vitriol in it: and 'tis supposed, some Copper, but so little I could never extract any. From Mr. Boothe's Works at —— in Cheshire.

2. Another Sample, with Spots of a fine blue; from the same Mines.

3. Another, from the same Mines. It has an admixture of a brass-like Marcafite, and white Spar, with some small Quantity of Copper.

4. Another, without Spar or Marcafite, holding somewhat more Copper, with a little Lead or Antimony, as I judge by View. From the same Mines.

5. A gritty Copper-Ore, with Spots of brown and green. It has a few Grains of Lead-Ore in it. From Cumberland. Mr. Nicolson.

6. A yellowish brown Spar. By its weight I conjecture 'tis impregnated with some Metal, probably Copper. From the Copper Mines of —— in Cumberland. Mr. Nicolson.

7. A Spar of a brick Colour, from the same Mines; perhaps it holds a little Copper. Mr. Nicolson.

8. Spar, white and green: it contains Copper. And there are several Grains of something which appears like Lead. From a Lead-Mine at Nenthead in Cumberland. Mr. Nicolson. vid. l. 35. infra.

9. Spar, white and green, with a very bright blue. It holds a little Copper. From the same Mine. Vid. l. 36. infra.

10. A brown Spar, with Spots of blue and green. It holds a little Copper. From the Mines of —— in Cumberland. Mr. Nicolson.

11. Spar, pellucid and green, crystallized: with an admixture of a little Marcafite, and a little Copper. From Callibock Copper-Mines, Cumberland. Mr. Nicolson.

12. Spar, white, pellucid, and green, with an admixture of Marcafite, Lead and Copper. From —— Cumberland. Mr. Nicolson.

13. Spar, brown, with a little green: and a great Proportion of a Brass-like shining Marcafite, also a little Copper. From the Mines of —— in Cumberland. Mr. Nicolson.

13*. Another Sample, one half consisting of Spar, white, with a Cast of brown: the other of a yellow shining Marcafite. In this
this latter appear several Spots of a green Colour: and some few of a fine bright blue. In one Part of the Spar, is a small Cavity set round with Shoots of a diaphanous crystalline Spar: and some of the Crystals have a fine soft glance of yellow with an Eye of red. From the same Mine.

l. 14. Spar pellucid, white, and green, with a little Marcasite and Copper, and a very small share of Lead. From Cardiganshire. It lay within a Fathom of the Gras.

l. 14*. A Mafs consisting chiefly of white Spar a little pellucid, with Veins of Antimony, and several green Copper Spots. 'Tis said to yield a little Lead. There is a Vein of Marcasite in it, but so fine 'tis scarcely discernible. Found with the foregoing. The five first of these Bodies are Stoney, and not worth working. The following are Sparry, hold little Copper, and ought rather to have been rank'd amongst the Vein-stones.

l. 15. White Spar, with a Brass-like Marcasite, and a small admixture, as it seems, of pure Virgin-Copper. Mr. Southwell.

l. 16. A blackish Copper-Ore, very poor, with Spots of green. On one side of it is a crystalliz'd Spar, pellucid, and green. Mr. Kingdon's Mines in Northumberland.

l. 16*. A Copper-Ore, with Spots of green, blue, and blackish: also an admixture of Marcasite. It holds about 4 of Copper. From the same Mines.

l. 16†. A green æruginous Ore, from the perpendicular Fissures of the same Mines. It holds about 5 of Copper.

l. 17. Spar, white and green, with an admixture of Marcasite, and some little Copper. Cumberland. Mr. Nicolson.

l. 18. Copper-Ore, of a dusky brown Colour, with Spots of green and blue. There is Marcasite amongst it, and a very little Iron. Cumberland. Mr. Nicolson. Vid. l. 37. infra.

l. 19. Copper-Ore of much the same Colour with the former. It contains a very little Copper, with Marcasite, and a small admixture of Iron. There are in some Parts of it capillary or fibrous shootings of the Copper, of a green Colour, very pretty. Near Ashburn in the Peak.

l. 20. Another Sample, not much different from the former, it probably may hold about 15 of Copper. From Cumberland.

l. 21. Another, with Veins of green, a ruddy black, and yellow sulphurous Marcasite. It seems to hold about 13 of Copper. From the Peak.

l. 22. A Marcasite of a shining, brassly Complexion, with Spots of purple and blue. It seems to hold about 15 Copper: and, as 'tis said, a little Tin. From Cornwall.

l. 23. Copper-Ore, of a fine purple Colour, with an admixture of a shining brassly Marcasite, and white Spar. It is said to hold 3 of Copper, but this Sample does not seem really to hold above 15. 'Tis found in great Quantity. From the New Mines of Comarten, in Devonshire.
l.24. Copper-Ore of a dusky Colour, with green and blue. There is with it a small admixture of Spar. This holds $\frac{1}{2}$ of Copper. From Sir Thomas Stanley's Mines at Alderly-Edge, in Cheshire.

l.25. A green porous Ore, consisting of Laminæ, with some tuberous Efflorescencies. From the perpendicular Fissures of Mine in the Peak. It holds $\frac{1}{2}$ Copper.

l.26. Copper-Ore of a sky, or pale blue Colour; found in small round Lumps, some a little larger, others less than Peaše. They yield near $\frac{1}{2}$ Copper. Chester. Mr. Upton.

l.27. A blue porous Ore, with brown Spar adhering to it. The blue Part will probably yield $\frac{1}{2}$ Copper. From Mines formerly wrought by some German Undertakers at Worksworth, in the Peak.

l.28. Copper-Ore of a fine Azure Colour, that yields about $\frac{5}{4}$ Copper. From Malham in Yorkshire. It lies in a loose Soil, among white fibrose Lead-Ore, like that n.56. There is ten times as much of this latter Ore as of the Copper. It lies 8 Fathom deep.

l.29. Two Samples of Copper Ore of a somewhat deeper blue Colour. From Malham in Yorkshire. Mr. Lydall assures me that he has melted many Tuns of it, and it yields full $\frac{7}{4}$ Copper run with Sea-Coal. It makes a good Colour; for which use he sold one Tun for 100l. and 'twas carry'd to Rotterdam. These Mines are not now work'd.

l.30. Copper-Ore, of an Iron-Colour, with a Lamina of green adhering to it, and virgin or native Copper shooting out of it. From Mr. Truebody's Mines in Cornwall. "Purum autem sapis invenitur Aurum, Argentum, Æs, Argentum vivum: minus sapis Ferrum, & Plumbum cinereum: vix inaquam Plumbum candidum & nigrum." Agricola de re Metal. L.5. p.76.

l.31. Two Flakes of pure fine native Virgin-Copper. 'Tis in Plates, and malleable. From ——— in Cornwall.

l.32. A piece of the Stone to which the aforesaid Flakes grow in the Mine. 'Tis of an Iron Colour: and has some small Filaments of native Copper in it.

l.33. Native or Virgin Copper. Two Plates, one of them consisting of Grains like those of Sand cohering together, and constituting a flat Body, or Plate. The other Plate consists of Parts like small Threads. From the same Mines with the Flakes. n. 31. supra.

l.34. Two small Nodules, given me by the Name of Copper-Stones, and said to hold $\frac{1}{3}$ Copper. From ———— in Wales. Mr. Baden.

l.35. Spar, white, with some parts of a lovely green, and bright blue: In others there's a faint Cast of Purple. It has a little Copper in it, with some small Grains of Lead-Ore. From the same Mine, at Nenthead, with l.8. supra.
Another small Sample from the same Mine. Little Copper or Lead discover themselves in this. The Spar much as in the precedent. The blue is very fine, and the Spar, being partly diaphanous, shews the Colour pales deeper into the Substance or interior Parts of it. This differs little from l. 9. and is from the same Mine at Neuthed, Cumberland.

l. 37. A piece of Copper-Ore, of a dusky reddish black Colour. Among it is a pretty deal of a yellow shining brassly Marcasite: with white and green Spar, whereof part is crystalliz'd. This is of the same sort, and from the same Mine, with l. 18. supra.

l. 38. Copper-Ore, red, with a Cast of purple. There are some Grains of Spar intermix'd with it: and very fine capillary or fibrous Concretions, of a bright green Colour, like those of l. 19. From Sir Coppleston Bampfield's Mine at Northmolton, Devonshire. The Ore lies in the perpendicular Fissures. 'Tis in considerable plenty. The Ore of this Mine yields 3/4 of Copper one with another. 'Tis fold for 6l. 10s. per Tun. All of it holds a little Iron; which they free it from by melting some sulphurous or mundick Copper Ore along with it.

l. 39. Another Sample from the same Mine, of a dusky reddish Colour, with an intermixture of Spar, and a brassly, or as it is call'd, the Golden Marcasite. Some Parts of this Body shine very finely, and are of a beautiful Colour, betwixt a Purple and Blue.

l. 40. Another Sample of the same, in which the Spar, Marcasite, and the purplish-blue Parts, are more distinct: and so appear with more Beauty than in the precedent.

l. 41. Another, as well as the four following, from the same Mine. This, excepting a little grey Spar in it, is throughout of a purple Colour, glossy and shining.

l. 42. This is red on the Outer-parts: but within of a deep grey, glossy and shining, and much resembling the Grain of Steel where broken; only the Grain of this is somewhat coarser. From the same Mine; it yields 3/4 Copper.

l. 43. Two small Masses, each about the bigness of a Hazel-Nut. They are of a dusky green Colour, their Surface is smooth, and they appear very like two Drops of a melted Metal. They yield above half Copper. From the same Mine.

l. 44. A Piece of Copper-Ore, part of which is of a green, and part of a deep red Colour, 'Tis softer and more friable than any of the foregoing. It yields about 1/4 Copper. From the same Mine, at Northmolton, Devonshire.

l. 45. A Copper Marcasite, with a shining brassly Cast, in the Middle, but externally brown with a Cast of Copper. This is cover'd with a very fine florid green seruginous Curst, striated across, very much like the Crusts of the Hamatites, and the Septa of the Ladus Helmontii, and about 1/2 of an Inch in thickness. From the Isle of Man. Upon Tryal, in the Fire, I find that the Marcasite yields 3/4 of Copper: the seruginous Curst 1/2. Out of a small Drift in a Cliff, in the Mine-Haugh in Kirk Chris't Ryshen,
of the South side of the Isle. These Cliffs yield Lead-Ore: of which there are many Tuns now raised.

l. 46. Small Pieces of Copper-Ore, green, and very rich: in the middle of each is one, or more Spots, of Copper, very fine, and almost, of the natural Colour of that Metal. This Ore, upon Trial, yields \( \frac{2}{3} \) of Copper. *Isle of Man.* Found with the foregoing.

l. 47. Four Maffes of Copper-Ore, light, porous, and friable: brown within, and externally environ'd with a very thin Coat of green, villoso or nappy, and not unlike Velvet. Perhaps this may be the *Viride Montanum* of Dr. Lifter. *Isle of Man.* Found with the foregoing.

l. 48. Native Copper, flexible and malleable, in small Maffes, some of which are granulated, others ramose. In some parts it appears of the native Colour of this Metal: in others, 'tis ting'd with green. Also a Piece of Copper-Ore, of a deep brown with a Coat of red, and Sparks of a very bright native Copper. On some Parts of it is a green Ärugo: and on others, a crysalliz'd Spar. From the *Isle of Man,* found loose upon the Sea-shores, near the foregoing: being beat out of the Cliffs by the Sea.

l. 49. Native Copper, with bits of white Spar amongst it, from *Poldice Mine, Cornwall.* The Vein of this lies higher up in the Hill than that of the Tin.

l. 50. Native, or, as 'tis call'd, *Virgin-Copper,* extremely pure; and malleable; from - - - - in *Cornwall.*

l. 51. Native Copper, fine, flexible, and malleable. *Chefswater, Cornwall.*

l. 52. Copper-Ore, Part of it black, with a Coat of red, and Part green. Near *Ashburn in the Peak.*

l. 53. Copper-Ore, green; and amongst it Crystal, part of it pellucid, and part tinged throughout with green. *Hartley, Westmorland.* The Emerald owes its green Colour to an intermixture of Copper, and so does the Saphire its blue. This Metal assumes the one or the other of those Colours according as the Nature of the Matter, with which it incorporates, happens to be. Copper dissolved in a volatile Alcali, as Spirit of Urine, or Sal Ammoniac, takes a blue Tinture: in an Acid, e.gr. Vinegar, strong Aquafortis, or the like, it becomes green. (Pliny took notice that the *Emerald* was found *in Copper-Mines, in Metallis aerariis.* Nat. Hist. l. 37. c. 5. p. 714.)

l. 54. Spar, part grey, and part brown; with green Copper-Ore. Also a fine blue Copper-Ore: and amongst it Crystals shot into very small Columns of a bright blue Colour. From *Cockly-Beck,* in High *Furness, Lancashire.* The Saphire owes its Colour to an intermixture of Copper.

l. 55. Copper-Ore, brown, vein'd with blue, and green: and having in one part a Vein of Mundick. Found in a perpendicular Fissure, in the *Shrees,* a very high Mountain in *Cumberland.* Upon Tryal it yields \( \frac{2}{3} \) Copper. This Vein has not been work'd.
l. 56. Gritty Copper-Ore, green, from 
*Chefwater Mine*, Cornwall. It lies 25 fathom deep. The Load is one Foot and a half 
over. 'Tis of difficult Fusion.

l. 57. Gritty Copper-Ore, green, *Candbeck*, Cumberland. It is 
not work’d.

l. 58. Copper-Ore, with a little Tin; from Mr. *Baffet’s Mine* 
at *Camborn-Bacon*. It holds about ¾ Copper.

l. 59. A Mats from a considerable Vein in a Mountain two 
Miles from *Goldscap*, in Cumberland. 'Tis of a dusky Colour, 
with Spots of green, and blue: as also bright shining Sparks ap-
pearing to be either of Lead or Wadd. This is within a Mile of 
the Wadd-Mine: and I have seen Samples of this Vein that had 
Specks of Wadd more plain in them.

l. 60. A Marcaflate, externally brown: within of a shining braffy 
Constitution; with Specks of green. *Isle of Man*. Given me by 
my Lord Derby.

l. 61. Mundick, holding Copper; with white Spar, and Specks 
of a Copper Colour. It fill’d the Vein: and there are Parts of 
the Sides of the Vein adhering to the two opposite Surfaces of it. 
*Sir William Penington’s*, *Coryton-Fells*, Lancashire.

l. 62. Mundick, diffus’d in Strings thorough the common 
Vein-flone in the Grand Vein of *Goldscap*, Cumberland. A Piece, 
broke off this, upon Tryal with the black Flux, after a flight 
Roasting, yielded ½ of fine Copper at the first running. Vid, 
i. 22. supra.

l. 63. Copper-Ore, of a dark brown Colour near black, with 
some Specks of green. It holds also a little Tin. *St. Columb*, 
Cornwall.

l. 64. A glossy Purple Copper-Ore. *Comarten*, Devonshire.

l. 65. Part of a Pyrites, black, with Veins of yellow and pur-
ple. It holds Copper. The Mine was lately discovered in the 
Estate of *Sir Thomas Aiton*, at *Nun-Eaton*, in Warwickshire. I 
observer several of these Pyrites; which were all, in Form oblong, 
compreis’d, or flat, growing gradually thinner towards the two 
opposite Edges; in such fort as pretty nearly to refemble the Ribs 
of an Animal*. I can determine nothing concerning their length, 
having seen none but what were broken; but some of the Pieces 
were two Foot long. As to their breadth, I observ’d of all Di-

mensions from an Inch to above half a Foot. They lay very close, 
and in great numbers, in a Stratum of greyish Stone: at the 
Depth of about 20 Foot.

**CLASS XI. PART II.**

**The Ores of Tin.**

**PREFACE.**

*This Metal is no where found so pure as to be malleable.*

Vid. Agric. p. 421. a. supra.

*In which Form Jet is sometimes found. vid. 8. 30, 31. supra.*
The Tin-stones, or Ores, crude, and as taken out of the Mine, yield the richest, about 1 in 30: the middling Ores, about 1 in 60: and the poorest, about 1 in 120; for even such are work'd to some small Profit. But when the Ores are dress'd, and brought, by stamping, and washing, to what they call Black-Tin, which is the Ore clean'd and prepared for the Fire, they yield \( \frac{1}{2} \) Metal; or, if well dress'd, more, perhaps 5 in 8; which the Tin-Grains yield without any Dressing. For these are large, and may be easily pick'd out from amongst Sparry, Sandy and Stony Matter. Whereas the small Sparks of Tin-Ore require those Methods to separate and extricate them. All Tin-Ores, that are capable of clean Dressing, yield pretty much alike when dress'd.

I have said something of the Shafts, trailing down from the Loads, or main Veins of Tin, towards the Sea, in Appendix II. to Class I. supra.

The Extract.

1. Tin-Mines mention'd in the following Class.

| St. Martins-Mine, near St. Austle, m. 1. |
| St. Agnes, m. 2. |
| Trevannas St. Agnes, m. 3. |
| St. Tuir, m. 4. |
| Redruth, m. 5. 7. |
| Godolphin-Ball, m. 6. 17. |
| Poollice, m. 8. 24. |
| Polgoth, m. 9. |
| Penrose, m. 11. |
| The Pell, Gunlaus-Works, m. 12. 22. |
| Trevala, Redruth, m. 13. |
| St. Breigh Downs, m. 14. |
| Carn Barn, m. 15. |
| Wheal and Coats Luggon, m. 16. |
| Carrack-Glose Works, m. 18. |
| Trevetho, m. 19. |
| Wythell, m. 20. |
| St. Columb, m. 21. |
| Budnoch, m. 23. |
| Beam-Works, m. 25. |
| Luggon, m. 26. |
| Wayleggon Downs, m. 27. |
| Wheal and Crack Works, m. 28. |
| Carneban Works, m. 29. |
| St. Tzen, m. 30. |

2. The Depth of the Tin-Mines.

A Mine 200 Foot deep, m. 4. 17. — A Mine 40 Fathoms, m. 12. 26. — 80 Foot deep, m. 5. 29. — 20 Fathoms, m. 16. 20. — 40 Foot, m. 7. 21. 27. — 60 Fathoms, m. 18. 23. 30. — 150 Foot, m. 9. — 10 Fathoms, m. 23. — 20 Foot, m. 15. — 27 Fathoms, m. 14. — 45 Foot, m. 19. — 70 Fathoms, m. 8. — 30 Fathoms deep, m. 1. 22.


4. Of the Water in the Mines.

Water in the Tin Veins, not clear, m. 17. — clear and tasteless in the Tin-Veins, m. 7, 8, 9, 12, 15, 16, 19, 20, 21, 26, 28, 30. O 4. Water
Water clear, but of a harsh Taste. m. 23.
 —reddish, and tasting like rusty Iron. m. 14. 18.

5. Of the Strata of Earth and Stone through which the Tanners mine.
m. 2. & seq.

Killas call’d Raze by the Tanners. m. 9.

supra. and m. 19. infra.

A Shoad-Stone. m. 10.
‘Tin-flones beaten out of the Cliffs by Storms.’ m. 11.

7. The Tendency and Direction of the Load.

A Load running North-West. m. 28.
Loads running East and West, m. 3. 4. 8. 14. 18. 21. 23. 25. 26. 27. 29.
The Lead-Veins, in Cornwall, run the same Way. n. 102. 104.
The Iron-Load, North-West and South-East. o. 97.

8. The Thickness of the Vein, or Load of Tin-Ore.

A Load 4 Inches thick. m. 4. — 2 Foot over. m. 18. 26. 29.
 — 1 Foot. m. 5. 7. 10. 28. 30. — 15 Inches m. 19.
 — 3 Foot over. m. 9. Polgooth. — 10 Inches. m. 23.

Spar, the Load 2 Foot over, standing by a Tin-Load of the same Diameter. m. 18.
 — the Load 5 Inches thick, standing by a Tin-Load 2 Foot thick. m. 26.


10. The different Proportions of Metal in the various sorts of Tin-Ores.

Ibid.

Tin Grains yield at least \( \frac{1}{2} \) Metal. m. 1, 2, 3, 6.
 — of a Quadrangular Pyramidal Figure. m. 1, 6.
 — call’d by the Miners, Corns of Tin. m. 3.

11. The various other Bodies with which Tin is found incorporated.

Tin-Ore with black Spar. m. 19.
 — with white Spar. m. 2. 6. 13. 26.
 — with crystalliz’d Spar. m. 25.
 — attended with Spar and Cornish Diamonds. m. 18.
 — with Marcafite or Mundick.
 — with Copper. m. 14.
 — with Lead. m. 24.

Tin-Ores.

m. 1. Tin-Grains. A Sample fairer than ordinary. These yield above half Tin. This Sample was found thirty Fathom deep in St. Martin’s Mine near St. Austle. Mr. Scobell. The Grains, or crystalliz’d Shoots are Quadrangular, and of a Pyramidal Form. m. 2.
m. 2. Tin-Ore, grained, or shot, of a dusky black Colour, with a little white Spar in it. On the two opposite sides is an earthy Sand, of a Buff-Colour. It seems to hold at least one half Tin. St. Agnes, Cornwall.

m. 3. Tin-Ore. Mr. T. Lower collected this, and several others, for me. His Account of it is as follows. " 'Tis from Trevanas, St. Agnes. The Mine is in a Valley, the Ground on every side round, being higher. 'Tis twenty Fathom deep, downright, to the Load; which runs East and West. They sink thorough only two Strata to come at the Load. The first is of a black Earth, two Foot thick. The second is of white Kellas, down to the Load. There is much Water in the Shaft, draining thorough the Walls of the Mine. In the midst of the Load, in some Places, are hollow Cavities, wherein Tin-Grains are found, or, as the Miners call them, Corns of Tin."

m. 4. Tin-Ore from St. Tuife. T. Lower's Account. "The Mine is upon an Hill. 'Tis two hundred Foot deep. There are three Strata. The first is of black Earth, two Foot deep. The second is of a blackifh Earth, and Sand, mixed together, 6 Foot deep. The third is a sort of Grown down to the Load; which runneth East and West. 'Tis nine Inches over, and very well tinn'd. But in some Places the Load is not above four Inches thick."

m. 5. Tin-Ore, from Redruth. T. Lower's Account. " The Mine is in the side of an Hill, declining to the East. 'Tis eighty Foot deep, down strait to the Load. There are two Strata of Earth, and then one of Free-stone down to the Load. The first Stratum is black Earth two Foot deep; the second is of a yellow Earth four Foot deep, distinguished from the former by an horizontal Fissure; wherein is a loose sort of red sandy Matter, with some Water draining through it. Next is the Bed of Free-stone, lying flat and level; and the Load is one Foot over, running East and West. There is a small Matter of Water sloaking out of the Rock or Stone aforesaid."

m. 6. Tin-Ore, shot, in several Parts, into Grains; of which, all that are distinct, appear to be Pyramidal and Quadrangular. There is a light brown Sand, and some white Spar, mixed with it. Godolphin-Ball, Cornwall. Vid. m. 17. infra.

m. 7. Tin-Ore, holding about one half Tin. From Wheal-and-Crack, Redruth. T. Lower's Account. " This Mine is in a Valley, between two Hills. 'Tis forty Foot deep, downright. There are two Strata, the first is of black Earth, two Foot deep. The second is a sort of Yelvean Stone, and Earth, mixed together, down to the Load; with perpendicular Fissures from the first Stratum down to the Load. This is one Foot over: and runs East and West. There is a Spring of Water that cometh forth by the Load, as big as a Man's Wrist, very clear and tasteless. In this Place, in the old Works, fifteen Years since, was found an Oak-Tree, eighty Foot deep, with Branches and Roots, all, besides what was perished."

m. 8.
m. 8. Tin-Ore, Poldice. T. Lower's Account. "This holds about \( \frac{\sqrt{2}}{2} \) Tin. The Mine is 70 Fathoms deep downright. The first Stratum is of a yellowish Earth, four or five Inches. The second Stratum is of white Rubble, and Clay, down to an hundred Foot deep. Then there is a dun Stone which the Miners call Elvezian Stone, two Foot thick. Then the same sort of Rubble and Clay as before, down to the Load; which runs East and West, but dippeth away after an End Westward. There issues forth a Spring of Water as big as a Man's Leg, by the Load, very clear and tasteless. The Work is begun in a Valley, but is wrought home to the Shaft aforesaid by an Adit: and the Water drawn off by Engines."

m. 9. Tin-Ore, Polguth. T. Lower's Account. "This holds near half Tin. The Works are on the side of an Hill. The Surface is of a Raze, and a little red Earth. The second Stratum is of a white Clay, intermixed with this sort of Raze, as the Miners call Kellow, downright, an hundred and fifty Foot deep to the Load; which is three Foot over, very hard, and rich. There is a sort of Water rises out by the Load: and runneth East and West."

m. 10. A Shoad-stone, found near the Surface of the Earth. - - - Cornwall.

m. 11. A Tin-stone. This, and others of the same sort are commonly flung upon the Coasts, near Penrose, Cornwall, by Storms. The Tin-stones, which he thinks flung up by the Sea, are most probably beaten out of the Cliffs by Storms and Violence of the Sea.

m. 12. Tin-Ore from the Fell, Gunlaus Works. T. Lower's Account. "This Mine is forty Fathoms downright. Here is a small Spring of Water, but very clear and tasteless, issuing out, by the Load, on the South-West side of it, as big as a Man's Thumb."

m. 13. Tin-Ore, grey, sparkling, and porous, with a white Spar, in Quantity near equal to the Ore, intermix'd with it. From a Work called Trevela, in Redruth.

m. 14. Tin-Ore from St. Breigh Downs. It seems to hold some Copper, and about \( \frac{1}{2} \) Tin. T. Lower's Account. "This Mine is on Downs that are near level; having no defcent in half a Mile or more. The Mine is twenty seven Fathoms deep, downright. There are two Stratums. The first is of a reddish brown Earth, two Foot thick. The second Stratum is red Kellas, down to the Load; which runneth East and West. There is a Spring of Water, which issueth out of one side of the Load, as big as a Man's Wrist. 'Tis of a reddish Colour; and the Miners say it tasteth like old rusty Iron. I could not taste it, it being disturb'd by the Miners. By the side of this Load there is a Load of Mundick, four Inches over in some Places, in others, more."

m. 15. Tin-Ore from Carnit-Barn. It holds near \( \frac{1}{2} \) Tin. T. Lower's Account. "This Mine is in a Valley, and is twenty Foot deep, downright. They sink through two Stratums; the first is ...
of black Earth, two Foot deep: the second of Sand and Pebbles intermixed, down to the Load; which runneth East and West; having a Spring of Water, issuing out by the Load, as big as a Man's Wrist, very clear, and tasteless.

m. 16. Tin-Ore from *Wheal and Coats-Lugggon*. It holds about \( \frac{1}{4} \) Tin. T. Lower's Account. "This Mine is on Downs that are level, and no way declining. 'Tis twenty Fathoms deep, going down from Shamble to Shamble. There are over it two Strataums. The first is two Foot and a half deep, of red Earth and small Stones mixed together; then a white Kellas, down to the Load; which is half a Foot over, running East and West, having a small matter of Water draining out by the Sides, (or as the Tinner's call it, the Walls) of the Country." [Vein, or Load.]

m. 17. Tin-Ore. *Gouldfin-Ball*. It holds about \( \frac{1}{4} \) Tin. T. Lower's Account. "The Work is between two Hills; and descendenith into two Valleys; one on the East-side, the other on the West. The Mine is two hundred Foot deep, perpendicular. There are two Strataums above it. The first is, of two Foot deep, black Earth: the second is of white Kellas, down to the Load. There is some Water in the Mine, but not very clear. The Load runs East and West." Vid. m. 6 supra.

m. 18. Tin-Ore, from *Carrack-Glofe Works*. It holds about \( \frac{1}{4} \) Tin. T. Lower's Account. "This Mine is on an Hill, and is 60 Fathoms deep: there are three Strataums over it. The first is black Earth, one Foot deep, (or thick.) The second Stratum is of white Kellas, four Foot thick. Then an horizontal Fissure, and under it, a brown Stone 7 Inches thick. Then a Stratum of red Kellas down to the Load. On the South side of the Load is a Load of Spar, full of Cornish Diamonds. The Load of Tin is two Foot over, and runneth away East and West. The Load of Spar, is two Foot over, running parallel with the former. 'Tis hollow in some Places, where the Diamonds are. There is a Spring of Water, issuing forth by the Load of Spar, and Tin Load. The Spring is as big as a Man's Wrist; and in Winter bigger than a Man's Leg, but of a red Colour; and of taste like old rusty Iron. The Hill is as high as Bow-Steeple perpendicular. On one side, 'tis bounded with the Sea; the other running into a deep Valley."

m. 19. Tin-Ore, from *Treveddo*. T. Lower. "It lies 40 or 50 Foot deep from the Surface of the Earth. The Work is on an Hill, very steep, 200 Paces, perpendicular, to the bottom, where runs a pretty large River. I went under Ground 150 Paces, or farther; it having been very much wrought in old time. The Surface is nothing but a sort of Rubble and Moss. The second Stratum is of a blackish sandy Earth. Then a perpendicular Fissure of a kind of a black Spar, some Places Tin in it, and some Places none. It leads from the second Stratum down farther than I could go; even under any Working. The third and last Stratum, is white Sand and Clay intermixed one with the other. And
And Figures or Veins are crossed one over the other in the Bottom, and run every way. Some are one Inch and a half over, others two or three, to 12 or 15 Inches over. The first the Miners call Strings, the latter they call the Load, which is commonly best tinned. There is Water in this Work, altho' on such an Hill, which issueth out of the Load, and round about it. This Water runs and finds a Way through the Earth. If there be, in any Mine, a Passage or Cavity in the Earth to receive the Water, then there is a good Air, and good working for the Men. If not, there happens many times unwholesome Air, and Damps; which not only impair their Health, but take away even their Life, as I have been informed by several Tinners, who have been in Mines where such Damps have happened; and some of the Men have died immediately in the Mines. Nay, some who have thus informed me, have themselves lain for dead for a considerable Time. In some Works, Damps happen where there is no Water. Great Damps come forth of the Earth, they say between the quick and dead Earth. These Damps have a very noxious smell, and in a Moment take away a Man's Breath, if he venture to go up or down through the Shaft. They happen most frequently in Fenny-Ground: and are great Preages of Rain. I was told by a Miner, who seemed to be a sensible Person, that he saw a Man wound up out of a Tin-Shaft, dead to all appearance, but they rolled him (as their manner is) and his Body jerked and twitched on the Earth, like one poisoned, and so died.

m. 20. Tin-Ore, from Wythyell. T. Lower's Account. "This Mine is on a plain Downs. 'Tis 20 Fathoms deep, downright. There are two Stratums. The first of black Earth, two Foot thick. The second Stratum consists of red Kellas, down to the Load. The Load is a Foot over; and runneth East and West. There is, in this Mine, a small matter of Water, which the Miners call the Soaking of the Country."

m. 21. Tin-Ore, from St. Columb. It holds near half Tin. T. Lower's Account. "This Mine is on a plain Downs, with no Descent for a great way. 'Tis 40 Foot deep. There are two Stratums. The first is of black Fen Earth, a Foot and an half deep. The second is white Clay, and white Spar, mixed together down to the Load; which runneth East and West, dipping away toward the East: and there is a small Spring of Water issuing out by the Load."

m. 22. Tin-Ore, from Gunlas-Works. It holds about \( \frac{1}{2} \) Tin. T. Lower. "This Work is on the same Hill with Carrack-Gloose. There are, over the Load, but two Stratums; the first is of black Earth, one Foot thick. The second is only of white Kellas and white Clay, down to the Load. The Shaft is 20 Fathoms deep, downright. The Load runs East and West; and is one Foot over, without any Water."
fn. 15. Tin-Ore, from Budmck. It holds about \( \frac{1}{4} \) Tin. T. Lower's Account. "This Mine is on a Hill as high as Bow-steeple. The Mine is fifty Fathoms deep, downright. There are three Stratums; the first of black Earth, four or five Inches deep. The second is of brown Earth, three Foot deep. Then small Pebles three or four Inches deep, mixed with a blackish Earth. Then a red Earth, and small Kellas, down to the Load. This runneth East and West, being ten Inches over. Here is a small Spring of Water which ariseth not by the Load, but out of the middle of the Draught, out of a perpendicular Fissure; wherein is a fort of Spar, which runs down from an Horizontal Fissure. The perpendicular Fissure is at the Top not above two Inches over; but groweth bigger all the way downwards. So that at the bottom, it is seven or eight Inches over; and the Water that issueth out of this Fissure, tasteth hard, but is very clear."

m. 24. Tin-Ore. Poldice. This, besides Tin, seems to have Lead in it.

m. 25. A thin Vein of Tin-Ore, with crystallized Spar; found fifty Foot deep, in Beam-Works, The Load runs East and West. T. Lower.

m. 26. Tin-Ore, with Spar, from Luggon. T. Lower's Account. "This Mine is on the Top of a great Hill, declining on all Parts, except on the West-side, where it runneth away, for a Mile, on a Level. But on the East, North, and South, it runs down into Valleys, but in some Places in a Perpendicular, as high as Bow-Steeple; where there run forth Brooks of Water. The Mine goes down strait, about forty Fathoms; where the Load lies East and West; and is two Foot over. There issueth out, by the Load, a Spring of Water as big as a Man's Wrist. It cometh from the West; and on the South-side of the Tin-Load is a Load of Spar, about five Inches thick, in some Places pretty clear. There are three Stratums: The first is black Earth two Foot thick. The second is of red loose Earth, three or four Foot thick. Then there is an Horizontal Fissure of Spar, four or five Inches over. Lastly, all white Kellas, and white Clay, down to the Load."

m. 27. Ore, holding about \( \frac{1}{4} \) Tin, from Warleggon-Downs, about forty Foot deep. The Surface is of black Fen-Earth, 12 or 13 Inches thick. The second Stratum is of Sand, mixed with Earth. The third Stratum is of great Rocks of Moor-stone, and Sandy-Earth, repofited together, down to the Load, which runs East and West. It lieth on a Hill.

m. 28. Ore, holding about \( \frac{1}{4} \) Tin, from Wheal and Crack-Works. This Mine is on the side of a Hill, 100 Paces to the Bottom. The Shaft or Mine goes downright; and the first Stratum is about two Foot deep, being a black Fen-Earth. The second Stratum is of Kellas, down to the Load, being ten Fathoms deep; and runneth away North-West. The Load is one Foot over;
over; and a Spring of Water issues out by the Load: But the
Water is carry'd away by an Adit, which is brought from the
Bottom.

m. 29. Ore, holding about $\frac{1}{3}$ Tin, from Carneban-Works. There
are two Stratums. The first is black Earth, sixteen Inches deep.
The second is of white Kellas, down to the Load. The Mine is
eighty Foot deep; the Load two Foot over, and runs East and
West.

m. 30. Ore holding about $\frac{1}{4}$ Tin, from St. Twen. This Mine
is sixty Fathoms deep downright. There is, over the Load, two
Stratums. The first is of black Fen-Earth, two Foot deep. The
second is a blackish Elvean Stone, down to the Load. There is
Water draining in, within seven Foot from the Surface of the
Earth. The Load dippeth away toward the East, and is a Foot
over, being very rich in some Places.

CLASS XI. PART III.

The Ores of Lead.

PREFACE.

Lead-Ore has obtained various Names: 1. From its Colour;
Blue Ore, Grey Ore, White Ore. 2. From its Constitution and Tex-
ture; Capillary, Fibrofe or Stringy Ore, Striated or Antimoniated
Ore, Steel-grain'd dOre, Sparkling or Star-grain'd ore. Broad-grain'd
or Smooth-grain'd Ore, Cross-grain'd Ore, Diced, Cubic, or Tessel-
ted-Ore. 3. From its Form; Flat, Plated, or Rib Ore, that ever
stands Edgeway or Parallel to the Sides of the Vein, Loofe Lumps
or Boofe Work of which, tho' those that are fo large as to require to
be broke for the Furnace, are called Knockings; tho' those that are
cover'd with any extraneous Matter, are called Coated Ore; tho' those
that are clear and free, Naked Ore. 4. From the Place in which
'tis found; Vein Ore, Belly Ore, Float Ore. 5. From its Use; Pott-
ters Ore. Several other Names have been given at random, by
the Miners of several Countries; of which some are hereafter exhi-
bited. Indeed, when this Catalogue comes to be review'd, the Names
appropriated to several Lead-Ores, especially those Sorts that are
brighter, and nearest resemble that Metal, ought to be corrected.
Thus, there are several Samples that are called by the Miners, Pott-
ters-Ore, and enter'd under that Name. Whereas, in truth, that
Name ought not to be refrain'd to one Sort of Ore, since the Potters
use all Sorts indifferently, those that are clean, or have the Appearance
of Lead, and melt freely. Such indeed, may have the generical
Name of Potter's-Ores, or, as they are styled in some Countries, Blue
Ores. And these may be subdivided into the three following subor-
dinate Species. 1. The Sparkling or Star-grain'd Ore; such as that
n. 34. 2. Broad-grain'd or Smooth-grain'd Ore; such as that, n. 42.
n. 112. And 3. The Cross-grain'd Ore; such as that, n. 104. and
n. 107.
n. 107. n. 75. and the Ores that follow, are better distinguished than some of the Precedent. The great or smelting Works commonly come up to the Assays of Lead within 1 in 20.

Lead-Ores.

EXTRACT.

I. The Names and different Sorts of Lead-Ores:

Talky or Stoney Lead-Ore. n. 17.
Potters-Ore. n. 64, 73.
— or, as the Miners call it, Blue-Ore. n. 82.
Potters, or Broad-grain'd, or Smooth-Ore. n. 42, 90, 111, 112, 118.
Broad-e'y'd Lead-Ore. n. 110.
Cros-grain'd Lead-Ore. n. 103, 104, 105, 107.
Star-grain'd Ore.
Honey-comb Lead-Ore, Mendip. n. 37.
Shelley-Ore. n. 106.
Small-grain'd Lead-Ore. n. 112.
Striated or Antimoniated Lead-Ore. n. 113.
Steel-grain'd Ore. n. 21, 69.
— or Galena, as this Kind is called by Pliny, and the Miners, who follow him. n. 21.
White Semipellucid Lead-Ore. n. 58.
White Foliaceous Lead-Ore. n. 74.
White Squamous Lead-Ore, call'd by the Miners White-Ore. n. 82, 83, 84.
White Fibrous Lead-Ore, call'd by the Miners, Stringy-Ore. n. 54.
— resembling Saccharum Saturni. n. 81.
— lies above the Potters-Ore, at Nenthead in Cumberland. n. 54.
— rare at Barrow-Work, Cumberland, but found along with the Potters-Ore, at all depths, where there is room for it to shoot. n. 75.
Lead-Ore, diced or cubic. n. 7, 120. & seqq.
— found in Vacuities, of the perpendicular Fissures. n. 120, 132.
— the Cubic Figure is owing to Crystal incorporating with the Lead. n. 132.
Lead-Grains so pure as nearly to approach the Fineness of Virgin Lead. n. 62, 63.
— call'd by the Miners Diced-Ore. n. 63.
Lead-Ore so pure and rich as almost to come up to the Purity of Native-Lead, being free from Spar and other extraneous Mixture. The Miners call this Naked-Ore. n. 127.

II. The
II. The Manner in which Lead-Ores lie in the Earth.

Lead-Ore found in the Veins, or perpendicular Fissures of the Strata. n. 27. & seqq. n. 112, 116, 118.
— brought thither out of the Bodies of the Strata, by Water.
— sometimes borne thence, and hurry’d into Springs and Rivulets by the Water, which proceeding out of those Veins, forms and supplies those Springs and Rivulets. n. 131.

A Lead-Vein eight Inches over. n. 104.
— one Foot over. n. 102.

The Lead-Veins in Cornwall run East and West. n. 102, 104. as the Tin-Veins there do. Vide Extract of Class X. Part 2. § 7.

Lead-Ore, with part of the Stone of the side of the Fissure to which it grows, n. 95, 96, 97.
— with part of a thin Rider of Stone in it. n. 96, 119.
— concreted, in Grains, on a dusky grey Stone, part of a Rider. n. 119.

Potter’s Ore, part of a Rib. n. 12, 81, * 97, 98, 106, 112, 115, 124, 125, 126.
— Part of a Rib that fill’d a String. n. 106.

Boole-Work or Naked-Ore found in Lumps. n. 60, 61.

Lead-Ore lying in a Float. n. 65.

III. The Fusion or Melting of Lead-Ore.

The Smelters come up to the Assayers, within 1 in 20. Pref. to Class XI. Part 3.

Of the smelting Works in Arkendale. n. 108.

Mendip Green-Ore runs with the greatest difficulty in the Fire, the white fibrous Lead-Ores with the greatest freedom of any in England. n. 49, 54.

IV. The different Proportions of Lead in the several Ores.

Potter’s-Ore, Arkendale, holding $\frac{1}{4}$ Lead. n. 111, 112, 114.
— Flintshire, holding $\frac{2}{3}$ Lead. n. 45.
— Worcsworth, $\frac{1}{5}$ Lead. n. 40, 41, 42.
— Austin Moore, $\frac{5}{8}$ Lead. n. 64.
— Sodbury, yielding $\frac{1}{5}$ Lead. n. 27.

Common Lead-Ore, Mendip, $\frac{1}{3}$ Lead. n. 29, 30, 33, & seqq.

Steel-grain’d Ore, holding $\frac{3}{8}$ Lead. n. 107.

Squamoïe or White-Ore, yielding $\frac{1}{2}$ Lead. n. 20, 26.

Fibroïe Lead-Ore, yielding $\frac{2}{3}$ Lead. n. 54, 56.

Richmond, Diced-Ore, $\frac{4}{8}$ Lead. n. 63.

Squamole or White-Ore, yielding $\frac{1}{4}$ Lead. n. 82, 83, 84.

Caldbeck, Green-Ore, yielding $\frac{1}{8}$ Lead. n. 52.

Steel-grain’d Ore, holding near $\frac{1}{2}$ Lead. n. 20, 26.

Gritty Lead-Ore, yielding $\frac{1}{2}$ Lead. n. 87.

V. The
V. The Proportion of Silver in the Lead of different Mines.

Devonshire, Steel-grain'd Ore, a Tun yielding 30 Ounces of Silver. n. 20.

The Company's Welch Mines, Steel-grain'd Ore, a Tun, yielding 30 Ounces of Silver. n. 21.

Potters-Ore, near Holy-Well, Flintshire, 18 Ounces per Tun. n. 45.

Dovegang, Potters-Ore, yielding upon trial, but 4 Ounces of Silver per Tun. n. 26.

Lead, of the Talky-Ore, Wales, a Pound yielding 14 Grains of Silver. n. 17.

VI. Combinations of the different Sorts of Lead-Ore each with other: and of Spar, Marcasite, Calamine, and other Minerals, and Metals, with Lead-Ore.

Fibrofe Lead-Ore concreted on Potters Lead-Ore, n. 81, 85, 86.

Potters Lead-Ore in Lumps, cover'd over with a Crust of white Spar and Fibrofe Lead-Ore, call'd by the Miners Coated-Ore. n. 81.

Lead-Ore with white Spar. n. 19, 22, 25, 26, 46, 47, 66, 67.

— with a pellucid Spar crystalliz'd. n. 7, 68, 93.

— with a pellucid cubic Spar. n. 8, 59.

— with a grey Spar. n. 1.

— with a yellow Spar, that Colour proceeding from Lead incorporated with it. n. 5.

— with purple or iron Spar, and with green or copper Spar. n. 2, 5, 6, 8.

— with Spar, white, purple, and yellow. n. 92.

— with Spar and Talc. n. 17.

— with Cauk. n. 89, 95, 96, 112, 116.

Lumps of Lead-Ore in a Rib of Cauk. n. 129, 130.

Cauk incorporated with Lead-Ore, forced off the Vein by Water, worn, rounded, and brought forth into a Rivulet. n. 131.

Lead-Ore abounding in Arsenic. n. 82, 83, 84.

— with Marcasite. n. 123.

— with a glossy sulphurous Marcasite shot into small Cubes. n. 16.

— with yellow Mundick. n. 103, 104, 108.

— with Calamine. n. 28, 49, 50.

Steel-grain'd Ore, with Antimony. n. 18, 19, 22, 23, 38, 115.

Lead-Ore with Copper-Ore. n. 48, 74, 104.

VII. The various Depth at which Lead-Ore is found in the Mines.

A Lead-Mine, Mendip, 15 Fathoms deep. n. 28.

— 20 Fathoms deep. n. 30.

Row-Pits are the deepest on Mendip. The Lead-Ore is there found from 8 to 30 Fathom deep. n. 37.

A Lead-Mine, Charan-Math-Cob, Cornwall, 10 Fathoms deep. n. 104.

— Perran-Sands, 80 Foot deep. n. 102.

— Dovegang, the deepest of any in the Peak, being upwards of 60 Fathoms. n. 26.
Potters-Ore, Flintshire, found from 15 to 30 Fathom deep. n. 45.

Lead-Ores.

n. 1. A piece of a coarse, greyish, ponderous Spar, with a thin Plate of Lead-Ore, adhering to part of it. From Cumberland. Mr. Nicolson, since Lord Bishop of Carlisle.

n. 2. White Spar, with a faint Cast of purple and green. There's Lead-Ore incorporated with it, Cumberland. Mr. Nicolson. Those two Colours in the Spar are Signs of some small admixture of Iron and Copper with it.

n. 3. Another Sample, in which the Purple is stronger. From the same Mine.

n. 4. Lead-Ore, of the Potters sort, lying very fair, and distinct in Spar white, with a slight reddish Cast. Cumberland. Mr. Nicolson.

n. 5. Lead-Ore in a white or semi-pellucid Spar, with a Vein of a yellowish Cast, and another of purple. Those two Colours are owing to an admixture, the yellow of Lead, the purple of Iron, incorporated with the Spar. Cumberland. Mr. Nicolson.

n. 6. Lead-Ore in a semi-pellucid white Spar, with a very fine green Spar, that Colour being owing to an admixture of Copper, incorporated with it. Worksworth in the Peak.

n. 7. Lead-Ore, part of a large Cube, having upon it a white pellucid Spar crys talliz'd. Cumberland. Mr. Nicolson.

n. 8. Lead-Ore, with a pellucid Spar curiously shot into small Cubes. From - - - in the Peak.

n. 9. Lead-Ore in a coarse white Spar, the Grains or Mafles of both large. From Worksworth in the Peak.

n. 10. Lead-Ore in a like Spar, but the Grains of both less. From Mugglesworth-Park, in the Bishoprick of Durham. A Tun of this Lead yields 60 Ounces of Silver. Vid. n. 25. infra. I have seen Lead-Ore, incorporated with Spar, exactly after the manner of this, from Shildon, near Blanchland, in the Bishoprick of Durham.

n. 16. Lead-Ore, of the Potters sort, very fine, incorporated with a yellow glossy sulphurous Marcasite, part of which is shot into small Cubes. From St. P's Work, Cornwall. Mr. Crow.

n. 17. Lead-Ore, with Tale, and a little Spar, equally mix'd with it. It holds about 1/3 of Lead. From - - - - - in Wales. Mr. Kemp. A Pound Weight of the Lead reduced out of this Ore, yields about 12 or 14 Grains of Silver. This the Miners call a Talky or Stoney-Ore.

n. 18. A Mass consisting of white Spar, a greenish yellow Marcasite, Antimony, and Lead, of that sort the Miners call Steel-Ore, all pretty equally intermix'd. From - - - - - in Devonshire. Sir Hen. Northcote.

n. 19*. A Sample of like sort, with an Admixture of white Spar. It holds Lead, Antimony; and, as 'tis said, Silver. From Birch-Bank in Blackburn, Cumberland.

n. 20. Ore, very sparkling, of the Steel-Grain. It holds near half Lead, some Antimony, Marcasite, Talc; and, as 'tis said, a little Tin. The Lead yields, of Silver, 30 Ounces per Tun. From Zirras-Newton, near Exeter, in Devonshire.

n. 21. Ore of the finest Steel-Grain. It has in one place a fine soft Coat of Purple, Blue, and Brass. 'Tis the richest I ever saw of this Mine, and holds \( \frac{3}{4} \) Lead. It has a little Silver in it; the Lead yielding 13 Ounces per Tun. Sir Carbery Price's Mines at _______ in Cardiganshire. This answers the Description that the Mineral Writers give of that sort of Lead-Ore, yielding also Silver, that they call Galena.

n. 22. Ore of the same sort, tho' the Grains be not quite so fine. There's with it a little white Spar, and Antimony. It holds \( \frac{3}{4} \) of Lead; and about 3 Penny Wt. of Silver in a Pound. [In the Spar of this Mine, sometimes Virgin Silver appears in small Plates and Threads.] From Comarten, Devonshire.

n. 23. Ore of the same sort, only the Grains yet larger, with some of the Potters-Ore adhering to it. From Oden-Mine, under the Mount called Mam-Tor, in the Peak.

n. 24. More of the same sort, but the Grains still larger, with an Admixture of a coarse white Spar. It may hold about \( \frac{5}{6} \) Lead. There's a little Marcasite Matter in it. From _______ in Cheshire.

n. 25. Another Sample, with the Grains larger than the foregoing, and not unlike that which the Miners call the Star-Grain-Ore. It may hold about \( \frac{4}{5} \) Lead. There's a white semipellucid Spar mix'd with it. From Mugglesworth-Park, in the Bishoprick of Durham. Vide n. 10. supra.

n. 26. Lead-Ore, with an Admixture of white Spar. It yields above one half Lead. Worksworth, in the Peak. Dovegang is the deepest Mine in the Peak, and upwards of 60 Fathoms. Of all the Peak-Lead that I have known tryal made, none yields, of Silver, above 4 Ounces per Tun. There's little Steel-grain'd Lead-Ore found in the Peak.

n. 27. Lead-Ore, in a thin flat Form, being taken forth of a small perpendicular Fissure (which it fill'd) of a grey Stone. In a Mine near Sedbury, Gloucestershire. It yields \( \frac{3}{5} \) Lead.

n. 28. Lead-Ore, of the same Form, likewise from a small Fissure which it quite fill'd. 'Twas at about the depth of 15 Fathom. 'Tis as rich as the precedent. From Major Twiford's Work, at Chutton, Mendip. Somersetshire. On each flat of this, is a brown Mineral Concretion, appearing to be Calamine.

n. 29. More of the same; from other like Fissures, to one side of which this Oredhered. The same Mine. This yields \( \frac{5}{6} \) Lead.

n. 30. Another flat piece, but thicker, from one side of a Fissure of the same Mine, 20 Fathom deep. It is found in great quantity, and holds above \( \frac{2}{3} \) Lead, but little Silver; on one side
are Vestigia of the Rock to which it adhered, on the other various Protuberances. The Ore here, usually adheres to both sides of the Fissure: and, in the middle, is frequently a Drift of Clay, from 2 or 3 Inches to a Foot, nay sometimes 2 Foot thick. The different manner of the several successive Applications or Plates of the Lead successively incrusting on the Rock, is very observable in this Sample.

n. 31. 32. Two Pieces somewhat thicker, they were found 4 Foot deeper, adhering to one side of the same Fissure.

n. 33. This Sample has more Protuberances, and some of the Clay interspersed with it, from the side of another Fissure of the same Mine. This yields near \( \frac{1}{3} \) Lead.

n. 34. Part of a still thicker Piece of sparkling or star-grain'd Lead-Ore, with an admixture of Clay or Earth, found deep in the same Mine. Qu. Whether the brown and grey Matter adhering to this, be not Calamine? This yields near \( \frac{1}{3} \) Lead.

n. 35. Another, the Surface of the Tubercles caked over with a thin coarfe Spar. At near the same depth, in those Mines. Near \( \frac{1}{4} \) Lead.

n. 36. Lead-Ore, florid, with many Protuberances, and an admixture of white Spar. Out of a Fissure of a Lead-Mine ---- Mendip. Row-Pits are the deepest on Mendip.

n. 37. Lead-Ore, thick set with Tubercles, and several Pores or Intervals. The Miners call it Honey-Comb-Ore. There's a great deal of earthy Matter, of a rufi Colour, in its Intervals, and on the Surface of the Tubercles. This sort of Ore is found in the perpendicular Fissures of the Stone, in vast quantity, from 8 to 30 Fathom deep. From Row-pits, in Chutou Liberty, Mendip. Row-Pits.

n. 38. A Mafs of Lead-Ore that seems to have lain in the hollow of some Stone. Its Surface being unequal, and having Fragments of Stone adhering in almost all Parts of it. It may hold about \( \frac{6}{10} \) Lead; and a little Antimony. From ---- in the Peak.

n. 39. Another, of the Potters-kind. There's a whitif Sparry Matter adhering to a large Part of the Surface of it. From ---- in the Peak.

n. 40. Potter's-Ore, from Worksworth in the Peak. It holds near \( \frac{2}{3} \) Lead; but little Silver.

n. 41. Potters-Ore, as rich as the former. From Hartly-Castle, Westmorland.

n. 42. Broad-grain'd, or smooth-grain'd Potters-Ore, from Withen in the Peak. As rich as either of the foregoing.

n. 43. Potters-Ore. From ---- in Northumberland.

n. 44. Potters-Ore, having a talky Spar (of a greyish Colour with a green Cast) adhering to it. From ---- in the Bishoprick of Durham. Sir William Blacket.

n. 45. Potters-Ore, from the Lord Bishop of St. Asaph's Mines in Flintshire. 'Tis found in vast quantity, from 15 to 30 Fathom deep in the perpendicular Fissures of the Strata of Stone. It holds full
full ½ Lead; but scarce any Silver. Indeed there is but one Mine in this County, that affords Silver worth working: and that lies near Holy-Well, yielding 18 Ounces per Tun.

n. 46. Potters-Ore, with a Vein of white Spar passing through the middle of it. From a Lead-Mine at Penrose, near Kelstoun, in Cornwall.

n. 47. Lead-Ore, with a little white Spar adhering to it. From Sir Thomas Stanislaus's Mines at Duke's Æow in Lancashire.

n. 48. A Piece of Lead-Ore, flat, having fill'd a String, or small Vein, with a little Spar adhering, and Copper-Ore on one side green, and yellowish on the other. From --- in Cheshire.

n. 49. Lead-Ore of a Popinjay green Colour. 'Tis cavernous and porous, and has a little Calamine of a reddish brown Colour, in its Cavens. It yields ½ Lead; but hardly any Silver. This sort is found in considerable quantity from two to fourteen Fathom deep, both in the Strata, and in the perpendicular Fissures. Mr. Baden, from Blagen-Hill, Mendip. The Calamine Mines are very near. They smelt this green Ore, in a reverberatory Furnace, with the Coal of Mendip; running old Iron with it to imbibe the Sulphur. This is of the hardest Fusion, and the fibrous Ores, n. 54, 55; 56, the softest Lead-Ores we have in England.

n. 50. Another Sample, not so Cavernous, with Calamine mix'd with it. In this small Grains of Lead discover themselves to the Eye. From the same Mine. This is of a pale green, and more inclining to a yellow.

n. 51. Another of a Sea-green Colour, its Surface studded with several Tubercles. From the same Mine.

n. 52. Another of the same sort, of a yellow Colour, with a mixture of green. There's a little white Spar amongst it. It yields ¼ Lead. From Calbeck, Cumberland.

n. 53. Potters Lead-Ore. There adheres to it a friable Body of a rust Colour, with several small sparkling Grains in it. From the Lead-Mines at Brickhillburn, near Newt-head, Cumberland. Mr. Nicolson.

n. 54. Lead-Ore of a brownish Colour, consisting chiefly of short fibrous or capillary Bodies, variously disposed throughout the Mafs, the whole nearly resembling a coarse Saccharum Saturni. From the same Mine with the former. This lies in great quantity, at the top of the Mine, before they come to the Water. Underneath is Potters-Ore. This is my Lord Darwentwater's Mine and is one of the most considerable in England. This and the two following run easily in the Fire. These fibrous Ores yield, at the great Works, rarely above 8 in 20. It holds more Lead indeed, but, being of gentle Fusion, some of the Metal drives up with the Fire. They have no Sulphur, nor Arsenic in them: nor any Silver at all. This yields, on Assay, ½ Lead.

n. 55. Another Sample, of like fibrous or capillary Texture, and different in nothing from the former, only 'tis of a blackish hue. From the same Mine still.
Another, very curious, the capillary Bodies of a pale Straw-colour, disposed into numerous Fasciculi, variously disposed and laid upon one another. 'Tis very rich, yielding at least $\frac{1}{2}$ Lead, tho' nothing like that Metal appears in the whole Mass, it much more resembling a Spar than a Lead-Ore. 'Twas found in Barrow-work, a Mine in an high Mountain, near Keswick, in Cumberland. There are in it Specks of a yellow Matter, which probably are Sulphurous: and there is Mundick in the Veins of both this and the neighbouring Mountains.

75. Lead-Ore, flakey, and striated, the Striae parallel to each other. 'Tis white, with a slight Eye of yellow. Its whole Appearance is like that of a Spar, and nothing like Lead appears, tho' it be very rich of that Metal. From --- near Bristol. Mr. Cole.

76. Lead-Ore, white and semi-pellucid, appearing much like a clear Flint, both in Texture, Diaphaneity, and all other respects. From Mendip, in Somersetshire. Mr. Kemp.

n. 57. Another Sample from the same Place. This is intire, in form of a Nodule, transparent. The exterior Surface is a little rough. To the Eye 'tis no ways different from the common pellucid Pebles; but 'tis very ponderous, and rich of Lead. Vena plumbi candida, fluoribus candidis non pellucidis similis. J. Kenteman. Nomenclat. Foss. Mina. p. 83.

n. 58. Lead-Ore in Form of a Nodule, very fine, and rich, yielding above half Lead. It consists of fine thin Plates differently disposed, and variously reflecting the Light. Found together with the following, n. 61.

n. 60. Lead-Ore adhering to a Ball of white talky Spar. The Spar consists of small flat roundish Plates wedged together in a very observable manner. Near the Lead are several small Cubes of a more clear and crystalline Spar. 'Twas found in a Bed of Clay, 44 Fathom deep, in a Lead Mine at Hartly-Castle in Westmorland.

n. 61. Another, with a thin rough grey Crust covering it, thorough which the Lead appears. These form'd Lumps are very rarely found. This lay 36 Fathom deep in Clay. There were some others along with it, from the size of a Hazle-Nut to that of a Man's Fist. The Miners call this Naked-Ore. There was of the common Lead-Ore, in vast quantity, above these in a perpendicular Fissure, but none deeper; these Lumps lying at the Bottom of all. The Miners sunk deeper to search, but to no purpose. From Reeves's Works, in Chartereux Liberty. Mendip. The Lumps are of the same sort with those that they call in Yorkshire, Boosework; which are found there both in the perpendicular Fissures, and in the Bellies.

n. 62. Two Samples of Lead-Grains, so pure and fine, as to be near malleable. 'Tis shot into Figures, with plain sides, in manner
ner of Crystal, but not regular. From - - - - in Cumberland.

Mr. Nicolson.

n. 63. Another Sample of the same sort, tho' the Lead be not quite so pure. The Shoots in this are larger than in either of the former; the Planes of some of them being above half an Inch over. Those Planes are of different Figures: the Workmen call this sort Diced-Ore. 'Tis found in the perpendicular Fillures of the Stone of the Mines, the Lumps of it being from the Bigness of a Wallnut to that of a Man's Fift. This lay about 11 Yards deep. From Colonel Byerlye's Mines, on Richmond-Moor, 2 Miles West of Richmond, Yorkshire. It yields at least 2 Lead.

n. 63*. A Sample of the same Ore, and out of the same Mine. This has but little Lead in it; the far greater part of the Mass consisting of a white granulated soft Spar. The Grains are made up of a Congeries of short Fibres. In this Spar also there may be some Lead; that Metal sometimes affecting to shoot into such like Fibres, as in n. 54. & seq.

n. 64. A Piece of Lead-Ore, of the Potters kind, found in a perpendicular Fillure. Thorngill Lead-Mine, about a Mile from Aufen, Northumberland. The Aufen-Moor Potters-Ore yields Lead and Silver, much in the same Proportion with the Potters-Ore in the Peak. Conf. n. 26. supra.

n. 65. Another, little different, found in a Stratum of the same Mine. This Stratum of Lead was in one part about a Foot thick, and lay fairly in view for about 30 Yards, but grew less gradually till it came to the thickness of about 3 Inches. What is here call'd a Stratum, was, probably, rather a Float.

n. 66. Another, not different, only that it has a little white Spar mix'd with it. From Blay-gill Lead-Mine, which is near the former.

n. 67. Another, with a pretty Quantity of white Spar lying in Veins among it. From Mr. Bathurst's Mine, Arkendale, in Richmondshire. It lay in the bottom of the Mine, 71 Yards deep, in the middle of a perpendicular Fillure, two Foot over, amongst an earthy Matter.

n. 68. Another, in nothing different, but that the Spar in some places is shot into small Crystals: also from Mr. Bathurst's Mine.

n. 69. A piece of Lead-Ore of that sort which the Miners call Steel-Ore. From Hays, two Miles East of Aufen, Northumberland.

n. 70. Another, of the same Grain, with small Veins of white Spar in it. This is very brittle, and in a manner friable. From a Mine 24 Miles South-West of Aufen.

n. 71. A piece of Lead-Ore, but much resembling a white Spar. It is thick set with small Cavities, over the whole Surface of it. Being broken in one place, it appears compos'd of small parallel Fibres. From the same Mine with n. 58. supra.

n. 72. Another, of the same sort, and from the same Mine. This is more diaphanous than the former, the Cavities pass deeper
into the Body of it, and the Fibres lie in Sheafs, which variously intersect and cross one another.

n. 73. Lead-Ore of the Potters kind, with white Spar amongst it. From Sir Copleston Bamfled's Mines at North-Moulton, Devonshire.

n. 74. A white talky Spar, with a flat Base, rising to an Apex, almost in manner of a Cone, only the Apex is not over the Center of the Base, but verges towards one side of the Body. 'Tis three Inches over at the Base, and near as many in height being composed of Plates standing erect, and jetting from the Axis to the Surface of the Cone. 'Tis very ponderous, and doubtless contains Lead in it: as also a little Copper, whereof the green Spots at the Base are a Sign. Great-Ashby, Westmorland.

n. 75. A Piece of the capillary, fibrous, or, as the Workmen call it, stringy Ore, from the same Vein in Barrow-Work, Cumberland with that n. 56. from which it differs only in Colour, this being somewhat whiter. There are in it Specks of a yellow Matter: and Veins of grey; both probably Marcasite, or Sulphur. This stringy Ore is found out rarely. It grows at all depths of the Vein, in Hollows, where there is room for it to shoot, along with the Potters-Ore; which, with the crois-grain'd O're, are the common Ores of this Mine.

n. 76. Some Fasciculi of Ore of the same sort with the foregoing: adhering to Part of the Stone of the end of the Stratum on the side of the Fissure. From the same Mine.

n. 77. A large Piece of the same sort, from the same Vein, with a considerable Quantity of the abovemention'd (n. 75.) yellow Matter amongst it.

n. 78. Another, less, with the Fasciculi smaller. From the same Vein.

n. 79. Another, with a reddish gritty Matter interspersed. From the same Vein.

n. 80. Another, with part of the Fasciculi white, part brown, and part black; little different from that n. 55. From still the same Vein in Barrow-Work.

n. 81. Another, little different from the foregoing; only on one side is a reddish gritty Matter, and several small capillary Bodies, much like Saccharum Saturni. Also from the same Vein.

n. 81*. Part of a Rib of Potters-Ore, on the outside of which is a thin Crust, composed chiefly of the white capillary Lead-Ore, from still the same Vein.

n. 81 †. A Lump of very fine Potters-Ore; with the Surface covered all over with a thin Crust, composed partly of white Spar, and partly of the white capillary Lead-Ore. The Miners call it coated Ore. 'Twas found, among many others, some bigger, and some less, lying loose, sometimes in Clay, sometimes in an ochreous Matter of several Colours, call'd by the Miners Seyls, in the aforesaid Vein at Barrow-Work.
§ 82. Lead-Ore, whitish with a Cast of brown; composed of small Chips, or Plates, placed, some parallel, some cross to one another. From Gravel-Work, near Buckton, in Craven, Yorkshire. The Miners call this white Ore. It holds somewhat more than \( \frac{3}{5} \) of Lead. It lies in a Vein, and is found in vast Quantity, there being little Ore of any other kind, except here and there some of the blue Ore as they call it, or Porters-Ore. This white Ore abounds in Arsenic; and is the most poisonous and noxious of any Ore whatever; the Fumes and Flores, lighting upon the Grass, kill the Cattle to near a Mile's distance from the Smelting Works.

§ 83. Another Sample, little different, only that there are intermix'd Specks of a pale yellow Matter, which I take to be Arsenic. And there is in it a Vein of mineral Matter, partly Red, and partly Brown. From the same Mine.

§ 84. Another, also from the same Vein, gritty, and appearing like a Mass of white shining Sand. There are in it Grains of a black glossy Matter.

§ 85. White Lead-Ore, little different from § 82. with Porters-Ore amongst it, from the same Vein.

§ 86. Another Sample, also from the same Vein, but of a more dusky Complexion. It is likewise much more firm and compact; and seems to be very rich. There is in it a Mass of Potters-Ore.

§ 87. Gritty Lead-Ore, variegated with white, yellow, brown, and black; yielding \( \frac{1}{5} \) Lead. From St. Iffy, Cornwall.

§ 88. A Mass of Lead-Ore, the Grain and Texture not unlike that of Cauk, of a pale brown Colour, and very ponderous. The Workmen call it white milled Lead-Ore. From Erkergall, Montgomeryshire, Wales.

§ 89. Potters-Ore, in a Mass of brown Cauk; with a reddish glittering Spar adhering to it. From a Vein in Newlands, Cumberland.

§ 90. Broad-grain'd, or Potters-Ore, with much white Spar intermix'd. Moulds, Arkendale, Yorkshire.

§ 91. Cross-grain'd Ore; with white Spar, part of it crystalliz'd. Out of a Vein, Newlands, Cumberland.

§ 92. Lead-Ore, in Spar, part of it white, and part tinged with purple, the rest with yellow, Arkendale.

§ 93. Lead-Ore, that adhered to the side of a Vein; with white Spar, and many small Shoots of Crystal along with it. Arkendale.

§ 94. A Plate of Lead-Ore that grew to the side of a Vein. To the opposite side of it adheres a coarse Spar, very tuberous and ragged; such as is commonly called by the Miners Hungerstone; because when it runs forth and sprouts in this manner, there must be much room in the Vein, and consequently little Ore there, Arkendale.

§ 95. Lead-Ore, with white Cauk: this was affix'd to a side of the Vein, part of which still adheres to it, the said side being composed of a common dusky brown Lime-stone, of which many of the Strata of this Mine consist. Arkendale.

§ 96.
n. 96. Lead-Ore, vein'd alternately with Ore and Cauk. From the same Mine. This has also adhering to it a Chip of the side, of Lime-stone: and in the middle of it, Edges of two thin Riders of the same sort of Stone.

n. 97. Two parallel Ribs of Lead-Ore, united by Intervention of Spar. On one Part, are Vestigia of the side of the Rock, to which it adhered; on the other, is a Crust of grey glittering Spar. Moulds, Arkendale.

n. 98. Part of a thin Rib of Lead-Ore, with sparry Efflorefcencies on each side. Arkendale.


n. 100. Lead-Ore in Sparks, in grey Spar. There was much richer in the Vein, which was very large. Howden-Field, Northumberland.


n. 102. A Lump of Lead-Ore, from Peran-Sand, Cornwall. The Mine is 80 Foot deep. The Load is one Foot over; and runs East and West. Mr. Kingfou. I have made no trial of this; but suspect it to have in it more of Blende, or black Talc, than of Lead.

n. 103. Cross-grain'd Lead-Ore, incorporated with yellow Mundick. From St. Columb, Cornwall.

n. 104. Cross-grain'd Lead-Ore, with Mundick, and green Copper-Ore. From Charan-Math-Cob-Works, Cornwall. The Load is eight Inches over, and runs East and West. This lay ten Fathom deep.

n. 105. Cross-grain'd Ore. This was part of a Rib that fill'd a String. Newlands.

n. 106. Part of another Rib, from the same Mine. When the Rib is thus thin, 'tis call'd Shelly-Ore.

n. 107. Cross-grain'd Ore, very fine, and holding near ½ Lead. Barrow-Work, Cumberland.

n. 108. Ore of much the same sort, but not so rich, with Spar and Marcafite in it. Windegg, Arkendale. This is the only Mine in Arkendale that has Sulphur with the Ore. They run it without any Addition of Iron; and indeed nothing is used in any of the Smelting-Mills, for any of the Ore of Arkendale, but Wood, Peat, or Coal.

n. 109. Lead-Ore glossy and shining, formerly work'd for Silver, by the Hochfletters. Caudbeck, Cumberland.


n. 111. Broad-grain'd, or Potters-Ore, fine and clear. Holds near ½ Lead. Moulds, Arkendale.

n. 112. Another Mafs, part of a Rib, with Cauk adhering to one side of it. From a Vein, or perpendicular Fissure, Moulds, Arkendale. 'Tis rich, and holds near ½ Lead. Indeed the Ore of this Work, if well dress'd, yields one with another, above ½ Lead in the Smelting-Works. This is of the Broad-grain'd or Smooth-grain'd Ore.
n. 113. Small-grain'd Lead-Ore, holding Silver, Comarten. 'Tis striated, as if there was some Antimony in it.


n. 115. Sparky Lead-Ore, little different from the Steel-grain'd. 'Tis in two Ribs join'd: out of a String. Newlands.

n. 116. Sparks of Lead-Ore, in a grey stony Matter; found in a Vein. Howden-Field Northumberland.

n. 117. Steel-grain'd Lead-Ore, with Cauk, part white, and part greenish. Sent by the Name of Silver-Ore, from the Silver-Mine in Berveralton, Devonshire.

n. 118. Broad-grain'd Lead-Ore, with the Surface very tuberous and unequal, out of a Vein. Arkendale.

n. 119. Grains of Lead-Ore, growing on a dusky grey Stone, that was part of a Rider. From the Moulds, Arkendale.

n. 120. Lead-Ore shot into Cubes, and oblong Squares, put together in such manner as to form a Plate or flat Body. It float on edge, in a Vacuity of a Vein. Totter-Gill, Intacks-Nook, Arkendale.

n. 121. Another Plate from the same Vein, the Squares larger.

n. 122. Lead-Ore shot into Squares. The greater part of the Vein is thus shot, from a Mine of my Lord William Pawlet: I think it is called Hindrake, near Redhurst, in the North-Riding of Yorkshire.

n. 123. Lead-Ore very fine, shot into a multangular Figure, with Marcasite and Spar, in a Mine by Stainmore.

n. 124. Part of a Rib, very ponderous, fine, and rich, probably holding Silver. The Grain of it is in most Parts much smaller and finer than that of the common Steel-grain'd Ore. The Surface of this is pretty smooth. From a Vein in Totter-Gill-Intacks, Arkendale. Upon Trial of part of this, it yielded 3 Lead.

n. 125. Part of another Rib from the same Vein. The Surface is more rugged and tuberous. There are in it small Masses of the Potters kind interposed; but the main of the Body is striated, as if there were Antimony in it.

n. 126. Part of another, from the same Vein, with a Cauky Spar adhering to each Flat of it. The Grain of this is like that of n. 124. supra: but the Tubercles on the Outside of both this and n. 127. are of a Broad-grain'd Ore, and differ from that, in the middle of the Bodies.

n. 127. Lead-Ore, the purest and richest I ever saw; part of it being so very near the Constitution of melted Lead, that it may not unfitly be call'd Native Lead. This the Miners call Naked-Ore, as they do all other Kinds that are thus naked, and not covered with an extraneous Crust. Arkendale.

n. 128. A Lump of Naked Ore, extremely rich; found, lying loose and independent in a Vein, Arkendale.

n. 129. Part of a Rib of whitish Cauk, out of a Vein with small Lumps of very rich Lead-Ore inclosed in it. All the Ore I observed
observed in this Vein was of like fort, and lay in like manner. 
Rushberry-Forest. Northumberland.

n. 130. Five Lumps of the fame Ore beat out of the Cauk. 
Their Surfaces are entire: and they part from the Cauk in such 
manner, as to shew that the Lumps of Ore are distinct, and not 
incorporated or mingled promiscuously with the Cauk, as is usu-
al in the common Ores.

n. 131. Four Masses of a whitish cauky Spar, with Grains and, 
Veins of Lead-Ore in them. These are rounded and worn smooth. 
They were found in a Rivulet, in Arkendale; and were probably 
born forth of the Veins of the neighbouring Mountains, by the 
Water rising out of those Veins.

n. 132. Lead-Ore of the Potters-kind, very fine. There is incor-
porated with it several Masses, of a white friable Substance, 
form'd into small Plates set edgewise; as also very numerous 
cubic Crystals, some of them transparent, but having a Caft of 
yellow; others opake, having their exterior Surfaces black, and 
some few brown. This was taken up at the depth of about 30 
Foot, in a Vein of a Mine of Mr. W. Hodgkinson, near Ashower in 
Scarfdale, Derbyshire. That the Ore of any Metal shoots, pro-
cceeds, generally, meerly from Crystal, combining with it in the 
Concretion and Formation of the Mafs. Crystal, pure, and 
without Mixture of other Matter, concretes over into an hex-
agonal Figure, pyramidal or columnar, terminating in an A-
pex or Point. Mineral or metallick Matter concreting with it, 
frequently determines it to other Figures peculiar to the Disposi-
tion of each Kind of that Matter. Iron concreting with Crystal, 
determines it to a rhomboid Figure *: Tin, to a quadrilateral Py-
ramid †: Lead, to a Cubick ‡. Where the mineral or metallick 
Matter thus concreting with the Crystalline, is equally diffus'd,
throughout the Body of it, and in so small Quantity as not to be 
perceived by the Eye, the Body continues still near as transparen
t as Crystal. Where the mineral or metallick Matter is in greater 
Quantity, so as to take the Eye, the Body appears imb'd and 
tint'd with the Colour, that the Mineral or Metal concreting 
with it, naturally gives and imparts; and is finer or higher, and 
more saturate, in proportion to the quantity of the mineral or 
metallick Admixture. 'Tis to this, that all the ting'd Crystals, 
and the various ting'd Gems, owe their Colours. Lead incorpo-
rating thus, imparts a yellow; Tin, a black; Copper a blue or 
green; Iron, a purple, amethystine, and all the various sorts of 
Red. Where the mineral or metallick Admixture with the 
Crystalline happens to be superior, and in so great quantity, as 
wholly to render the Body Opake: and all shot or angular. Fossils that are Opake, owe their angulated Figure chiefly to, the 
Crystalline or harder gemmeous Matter, incorporated with
No other Matter, that I have ever seen, concreting into such figures; except, sometimes, a little Sulphur: of which there are Instances in some Pyrites and Marcasites. This Mass, n. 132. rightly reflected upon, exhibits some Phenomena that attest this Doctrine; and numerous other Instances there are, among the Bodies of this Catalogue, that give further Proof of it: to say nothing here of the Observations and Experiments in my other Papers, that favour and make it out.

CLASS XI. PART IV.

The Ores of Iron.

PREFACE.

There are some Ores in Germany that answer the Load-stone; inasmuch that, when finely powder'd, all the Iron leaves the Earthy Parts of the Ore, and applies itself to the Magnet. Laz. Erckern. L. 4. c. 21.

Iron is rarely found pure in the Earth, so as to be malleable. wid. Agric. L. 5. p. 421. supra.

From the Haematites, and some other Iron-Ores, are prepared several Medicines that are in frequent use; tho' I confess, I cannot approve of them.

Iron-Ores.

EXTRACT.

I. Names used, by the Miners, to distinguish the several sorts of Iron-Ores.

Smitt, o. 95*; 96. — also the Mother of the Mine. o. 96.
Iron-Stone, call'd by the Miners, Cabala-Vein. o. 3.
Gentle Pit-Ore. o. 4.
Ball-Vein. o. 5.

II. The various Bodies work'd for Iron. Their Origin, Texture, Constitution, and Figure.

The Geodes, and other crusted Bodies work'd for Iron. o. 1, 5, 6, 7, 102.
Iron Nodules in form of the Ludus Helmontij. o. 29, 30, 31, 32, 104, 105, 106.
Iron Nodules ally'd to the piped waxen Vein.
Iron-Ore, soft, and in form of Clay. o. 95, *95, 96.
Yellow Ochreous Bodies, yielding Iron. o. 2.
Yellow-Ochre in the Iron-Veins. o. 12.
in the Iron Geodes. o. 102.
Red Ochreous Iron-Earth. o. 62, 63.
Iron-Stone. o. 3, 4, 5, 8, 34, & seq. 103.
Hæmatites, Iron-Ore.  o. 42. & seq.

— composed of Crusts made up of transverse Fibres, like those of the fibrous Tales. o. 42. & seq.

Hæmatites sometimes form'd in Fissures, in the Forest of Dean. o. 11, 26.

— in Cornwall. o. 75.

Hæmatites having in it cubic Hollows, seeming to be Impressions of a cubic Spar, Pyrites, or other like Body. o. 47, 49, 50.

A Crust of Spar betwixt two Crusts of Hæmatites. o. 7, 8.

Iron-Ore shot into quadrilateral Pyramids, as if it held Tin; the Grains of that Metal being naturally in that form. o. 82.

— shot into Rhombs. o. 16, 18, 19.

— with Shoots and Efflorescencies somewhat resembling Erica, or the common Heath. o. 85.

Iron Stalaætite, found with the sparry, in the perpendicular Fissures; and form'd, after the same manner, by Water, bringing the ferraceous Particles out of the Strata into the Fissures, where it quits them, after, by its falling, as by an Icicle, it has dispos'd them to concrete into that form. o. 20, 21, 22.

— several united in one Fasic; and, for that Reason, call'd Brush Iron-Ore. o. 22, 24.

— small, black, join'd in a Fasciculus, each striated from the Axis to the Surface. o. 26.

— with ferraceous Rhombs upon them. o. 25, 27.

The Iron Stalaætitæ continue to be form'd to this day. o. 23.


Ferruginous Threads in Iron-Ore, seeming to be Native Iron. o. 11.

Iron-Ore, in a perpendicular Fissure, so rich as nearly to approach the Constitution of Native Iron. o. 81.

III. The Place and Manner in which Iron-Ore is found.

Iron incorporated with the Sand constituting the Stone of the Strata. o. 3, 4, 5, 8, 34, & seq. o. 103.

Iron-Ore form'd in perpendicular Fissures. o. 16, 19, 60, 81.

— a Load 3 Foot over, at Temple, in Cornwall. o. 97.

— running North-West, and South-East. o. 97.

Smitt found in Veins or perpendicular Fissures. o. 96.

Hæmatites lies in Bellies. o. 60.

An Iron Shoad-Stone, from the Peak, o. 41.

— from Cumberland. o. 100.

IV. Other Bodies incorporated with Iron-Ore.

Iron Nodules with Lac Lune in the Shrieks or Cracks. o. 104, 105.

Iron-Ore with Spar. o. 11, 12, 84.

— with bright sparkling Spar. o. 101.

— with crystaliz'd Spar. o. 12, 13, 14.
— with a reddish glittering talty Spar. o. 28.
— with Spar white with a Cast of Red. o. 98.
— with Crystals tinged red. o. 60, 61.
— with Marcele, called by the Miners in Cornwall, Cockle, o. 99.
— with a brass-like shining Marcalite, holding Copper. o. 99.
— with Lead-Ore. o. 10, 12.
— with fibrous Talc. o. 74.
Iron-Stone with a Vein of Coal in it. o. 36.
— with the Bodies call'd Screw-stones in it. o. 93.
— with Sea-shells in it. o. 4, 36, 38, 39, 40.
Hæematites with Spar crystalliz'd, semi-pellucid with a Tincture of red. o. 55, 59.

V. The Uses of these Bodies.
Of the Use of Hæematites in Medicine. Preface to this Part, Smitt us'd for a red Colour, by Painters. o. 95 *.
The Uses of Iron and of Steel are too many to be enumerated.

VI. The Proportion of Iron in the various Kinds of Ores.
Of the Fusion and smelting of them.
Iron-Stone, yielding $\frac{1}{4}$ Iron. o. 34.
— yielding $\frac{1}{4}$ Iron. o. 3.
Hæmatites, the richest of Iron-Ores, yielding $\frac{12}{5}$ of Metal. o. 42.
The Geodes and other crufiated Bodies run pretty freely in the Fire. o. 1.
Of the smelting of the Hæmatites Iron-Ore. o. 42.

Iron-Ores.

o. 1. A smooth flat Body of a brownish yellow Colour, about an Inch in breadth. From ——— in Sussex. Mr. Harris. 'Tis of a hard honey Constitution; and scarcely holds above $\frac{1}{9}$ Iron. It seems to have been a Nucleus, and included in a honey Crust. Indeed this, and several of the Bodies work'd for Iron in Sussex, appear to be of the same Constitution with the Geodes and Bezoar Mineral. Vid. o. 5, 6, 7. infra. That likewise from Derbyshire, o. 7. is of the same Constitution. The Sussex Ores run pretty freely in the Fire for Iron-Ores; otherwise they would hardly be worth working.

o. 2. Another larger, and paler, as also softer, and indeed only an Ochre. This seems also to have been a Nucleus: and has Fragments of two ferruginous Crusts within one another, still adhering to it. They are about $\frac{12}{13}$ of an Inch thick: and hold Iron. There is wedg'd into the Middle of it a Plate of about the same thickness, and much the same Constitution and Colour. From Battle, in Sussex.

o. 3. A piece of Stone flat, of a dusky brown Colour, with a slight Blush of red. 'Tis said to be pretty rich in Iron. The Miners call this Cabala Vein. Battle in Sussex. This yields $\frac{1}{9}$ Iron. Cons. o. 103, infra.
0. 4. Another, of a somewhat paler Colour. This has several shining Sparks throughout the Body of it, which probably are Grains of Spar intermix'd with those of the Stone. 'Tis a Piece of a Stratum: and in one part of it are many Fragments of some sort of small Bivalve. It holds scarcely so much Iron as the former. They call it Gentle-pit Ore. Battle, Sussex.

0. 5. Another broad flat Piece, gradually thinning towards the Edges. The interior Substance of it is of a brown Colour, the exterior a brownish yellow. There are Fragments of thin Crusts of a ferruginous Colour adhering to the Surface of it. This yields near as much Iron as n. 3. They call it the Ball-Vein, Battle in Sussex.

0. 6. Another, likewise gradually thinning towards the Edges. 'Tis of a brown Colour. There are Fragments of five Crusts of a ferruginous Colour, tho' some darker, and others paler, one over another, adhering to it, each about \( \frac{1}{12} \) or \( \frac{1}{12} \) of an Inch thick. From Battle in Sussex.

0. 7. Another, of an Iron-grey Colour, its Surface brown. There was a Crust upon it of a ferruginous Colour, and about \( \frac{1}{4} \) of an Inch thick, which easily parted off from it. This holds but little Iron. From Smally, in Derbyshire.

0. 8. A Piece of Stone of a dark Iron-grey Colour, but in some Parts of a ferruginous Colour. There are many extremely small metallic Spars mix'd throughout the Body of it. This seems to hold about \( \frac{1}{4} \) Iron, being more ponderous than any of the foregoing. From Staffordshire. There are thick Strata of this Stone. It lies about 15 Fathom deep over the Coal.

0. 10. Iron-Ore, said to hold also a small admixture of Lead. The interior Substance is of a grey Colour, shining: the Surface of a rust Colour. From near Torbay, Devonshire.

0. 11. Iron-Ore, of a dark ferruginous Colour, but in some places tending towards a yellow, and in others towards a white. There appear several shining Spary Sparks throughout the Body of it. In the middle of it is a Chink, or Hollow, lined with a shining Crust striated a-cross, like the Crusts of the Haemaites, and appearing to be of the same Nature. There are several Threads of a ferruginous Colour, and seeming to be native Iron. There were other Pieces that had the same kinds of Crusts very plain. From Cloverwall, in the Forest of Dean, Gloucestershire.

0. 12. Iron-Ore, of a ferruginous Colour, having a great Quantity of white Spar incorporated with it. There are several Chinks in it, all lined with crystalliz'd Spar, of a yellowish Cast. (Conf. 0. 13. & 0. 20.) From the same Mines. I observed a yellow Ochre, in small Quantities, in some of the Veins of these Mines: and the Rust of the Iron of some Mines, is of a brown Colour, verging upon a yellow. Tho' that Colour may be owing to Lead incorporated with the Crystall that constitutes that Stone; because of the Colour of Litharge, and of Vitrum Saturni. This is certain, there is Lead in this Neighbourhood.
0. 13. Iron-Ore of a ferruginous Colour, but in some Parts of a light brown. Throughout the whole Substance of it are extreme small Sparks of a glittering Spar. There are in it several Chinks, all bet set with a crystallized Spar, which in some is white, in others diaphanous, in others yellowish, in one brown, and in another red. The Mafs near this Chink is of a lively deep red Colour, and heightens the nearer it approaches the Chink, which besides the Spar has a fine bright red Ochre in it. From the same Mines.

0. 14. Another Piece, of an Iron-grey Colour, full of Hollows bet set with a diaphanous crystalliz'd Spar. From the same Mines.

0. 15. A piece of Iron-Ore of a ferruginous Colour. Throughout the Substance of it are several thin Plates, of near the same Colour, placed parallel to each other. The Intervals of these Plates are, in some places, fill'd with the said Iron-Ore, in others with a diaphanous Spar. From a Fissure of the Stone in the same Mines.

0. 16. A piece of the Stone of the same Mines, of a yellowish brown Colour, an arenaceous friable Substance, and with some white Spar mix'd with it. 'Twas broken from the side of a perpendicular Fissure. There are adhering to it small white sparry crystalliz'd Bodies, of several sides, in vast numbers. These, for the main, are placed in Rows, parallel to each other, and generally set each, in a thin ferruginous Socket. There are amongst them some Crystallizations of a rhoftiboid Figure. They are about of an Inch in Diameter, wholly opake, tho' the Surfaces be polite and shining, some of an Ochre, others of a rust Colour.

0. 17. Another, found together with the former, and little different from it.

0. 18. Iron-Ore of a deep ferruginous Colour, with Veins of a white and yellowish Spar. In it are several Cells bet set with Cubes or Rhombs, not different from those in 0. 16. only that they are all of a somewhat deeper rust Colour from the same Mines.

0. 19. Stone of the same sort with that 0. 16. from the side of a perpendicular Fissure. There's upon it an Irony Cruft, having an Admixture of Spar with it; and from that Cruft rises a striated Substance, partly of a ferruginous, and partly of an ochreous Colour, in Texture much resembling rotten Wood. Upon this, grow many of the aforesaid Rhombs, of a light ferruginous Colour. Some of the Rhombs, near the Cruft, being broken, shew that they consist of two Parts; there being in the Centre a greyish sparry Rhomb, included in a ferruginous rhomboid Cafe. From the same Mines.

0. 20. Small roundish Columns of a dark brown Colour, placed near a Parallel to one another, and cemented together by a white Spar with a yellowish Cafe. The Outsides of the Columns, I mean the Sides that terminate at the Surface of the Sheaf or Fascis of Columns, are frosted over, or thick set with small Sparks of a crystalliz'd Spar with a yellow Cafe. Still from the same Mines.
Mines. This was found in an hanging Posture in a perpendicular Fisure; and the Columns are no other than several Stalactite, partly ferreous, and partly sparry, run into one Body and conjoin'd together.

0. 21. Another found in the same Posture; and in the same Fisure, but three Yards distance. This is little different from the former, only some of the Columns are red; and the sparry Frost without more pellucid, and without any Cast of yellow.

0. 22. Other like parallel Columns, consisting of a Mixture of Iron-Ore, and Spar of a very dusky brown Colour without, but somewhat more pale within. 'Twas found in another Fisure in a hanging Posture, adhering to a reddish Stone, part of which is broke off with it. In the same Mines. This is what is called Brush-Iron-Ore. The Columns are of about the Thickness of a midling Goose-Quill.

0. 23. Another Sample, little different from the former, only the Columns are somewhat more distinct, found hanging in like manner from the Roof or Top of the Vault of an old Work now deserted. The Ore was exhausted; and these Bodies are grown since the Miners left off working this Mine. There are a great many of these hanging from the top of the same Vaults.

0. 24. Another, the Columns somewhat less, rougher and more uneven in their Surface, and of a lighter brown Colour. They lessen gradually as they descend, 'till at last they end in an Apex or Point. There are a few angular Crystallizations, not different in Substance or Colour from the rest of the Body, on the Outsidcs of some of the Columns. From the same Mines, and hanging down in the same manner.

0. 25. Another, the Columns of a lighter brown, with a larger Admixture of Spar in them. The Outsidcs of them are fet all over with Crystallizations of the same Colour, all tending towards a rhomboid Figure. Found in the same manner, in those Mines also.

0. 26. Another, chiefly of a black Colour. The Columns are broken off short, and are of the thickness of a Crow's-Quill. Within, they appear very black and shining, and are striated or radiated from their Axis to their Surface. In some Parts of the Mats to which these Columns adhere, are Edges of Crusts, of the same Colour and Constitution with the Columns, but striated across, like those of the Haematites. From the same Mines.

0. 27. Another of a reddish Colour: 'Tis in some Parts run into Columns, groffer, but not so distinct, as in 0. 22, & 23. The Surface is set all over with red Crystallizations, tending towards a rhomboid Figure, sparkling and briskly reflecting the Light; and so placed, that their Edges stand generally to the Surface. From a Fisure of the same Mines.

0. 28. A piece of Iron-Ore of a black Colour externally, and its Surface very unequal, much resembling a Cinder or Slag. Internally the Colour is a reddish brown. The Substance perforated with
with several parallel Pores; some of them empty, others fill'd with a reddish glittering talky Spar. From a Fissure of the same Mines. This is very rich.

0. 29. A Mass of an irregular Figure. 'Tis black without; and where broken, appears to be of a rust-colour. From Dudley Iron-Mines in Staffordshire. This is one of the Tali of a Nodule in form of the Ludus Helmontij. Conf. 0. 105. infra.

0. 30. Another, very black, both within and without. Where 'tis broke, there adheres a thin Film of a white Matter, like that call'd by Mineralists, Lac Luna. Out of the same Mine with the former. Conf. 0. 105. infra.

0. 31. Another, for the main a of rust-colour, with some Intermixture of black and yellowish. From the same Mine still. Conf. 0. 105. infra.

0. 32. Another, brown without, and of an ash-colour within. From the Iron-Mines of Wodbcsbury in Staffordshire.

0. 33. Another of a reddish brown without, and a somewhat more dusky brown within. From the Iron-Mines of Waldal, Staffordshire. Where broken, it exhibits some whitish Films, like those in 0. 30.

0. 34. A flat piece of an Iron-Stone; its two opposite flat Surfaces black. Where broken, it thows an ash-colour, with some yellowish Spots. From Godnor in Derbyshire. This is the most common Iron-Ore, or rather Iron-Stone, of England. 'Tis of the middling Tenor, and yields about 4 of Iron.

0. 35. Another of a dark-grey Colour, with a blush of red. From the same Mine.

0. 36. Another, of near the same Colour. There's in it a Vein of Coal of a very bright black; and another of a brown Spar. On one side is the Impression of a Bivalve, and some Flakes of the Shell still adhering to the Stone. From the same Mine.

0. 37. Another, of still the same Colour, with Veins of a brownish Spar. From the same Mine.

0. 38. Another, the Colour grey, yellowish, with a dusky brown. There are upon it Impressions of Bivalves of several sorts, and of different sizes. From -- -- -- -- in Sussex. Mr. Harris.

0. 39. Another piece of Iron-Stone, one side of a yellowish, the other of a reddish brown. On this side are Impressions of several small Bivalves. From -- -- -- -- in Sussex. Mr. Harris.

0. 40. Another, of a very dark brown. There are several turbinated Shells in it: Some of them fill'd with this Stone, others with white Spar. The Shells are generally perish'd and gone, and the Places of several of them fill'd with the same sort of white Spar. From -- -- -- -- in Sussex. Mr. Harris.

0. 41. A small Stone smooth without, and of a dark Liver Colour. 'Tis of the same Colour within, with the Addition of a faint Cast of Purple. From Worksworth in the Peak. This is what the Miners in Cornwall call a Shoad-Stone; it being a Fragment, broke off an Iron Vein, by the Water of the Deiuge depart-
ing; worn and smooth'd, by being hurry'd along by it; and finally left behind. *Conf. 4. o. 100. infra.*

0. 42. A Lump of Iron-Ore of a deep dusky red Colour. This is of that sort which is call'd by Mineralists *Lapis Hamatites.* Towards the Surface, 'tis cover'd with several Crusts, the thickest about \( \frac{1}{2} \) of an Inch, the thinnest not above \( \frac{1}{4} \); They lie close to and are exactly fitted upon one another. They consist entirely of transverse Fibres. The Surface is smooth, shining, and rising all over, in an elegant manner, into globular *Tubera* and Inequalities, not ill resembling a Clufter of Grapes. From the Iron-Mines of *Langron* near *Whitehaven, Cumberland. *Conf. Class 3. c. 263.*

The *Factitious Cinnabar* or *Cinnabar* of Antimony, much resembles the *Hamatites* in its fibrous Texture, and other ways. Now this Body is form'd in the Fire; and the *Hamatites* seem to have been so too; tho' it be difficult to account for that. The *Hamatites* Iron-Ore is found here, about *White-haven,* in great quantity. It yields about \( \frac{1}{3} \) in Iron; and is, perhaps, as rich as any in the World. It comes at the first Fusion into a Mafi that is immediately malleable, and will not run thin, so as to cast and mould, unless mix'd with poorer Ore, or Cinders. 'Tis carried over, and work'd up, chiefly in several parts of *Ireland,* where Wood is more plentiful, than in *England.* Besides, they carry it into *Cheshire, Staffordshire,* and *Pembrokeshire,* and there melt it down with their poorer Ores; it promoting their Fusion, and fetching the Iron of those Ores more freely and fully out.

0. 43. Another, little different, only in the Body of it, now broken, appear small Sparks of a glittering Spar. From the same Mines.

0. 44. Another, having only one Crust or Shell at the Surface, of about the thickness of a Line. The Globules in this, are smaller, the Surface more unequal, and the Body redder than either of the former. From the same Mines.

0. 45. Another, little different from n. 42. From the Iron-Mines of *Furness in Lancashire.* Mr. *Fitz-Roberts.*

0. 46. Another, consisting of several Crusts; whereof the innermost is near half an Inch thick, black, shining, and polite, and without any transverse *Stria* or Filaments. From the Mines of *Langron, Cumberland.*

0. 47. Another, consisting of only one Shell, breaking into several unequal Planes, black, shining, and polite, without any *Stria.* From the Mines of *Langhorn, Cumberland.* On the Inside of this is a cubical Cavity of about \( \frac{1}{4} \) of an Inch in Diameter, with several leffer, as if there had been either cubic Spar, *Pyrite,* or other like Bodies, lodged in it.

0. 48. Two Crusts, one upon another, each about \( \frac{1}{3} \) of an Inch in Thickness, and striated a-cross. From the same Mines.

0. 49. An *Hamatites* little different from that o. 46. only in the inner part, appears a cubical Cavity half an Inch over, and 2 or 3 leffer like Cavities. From the same Mines.
0. 50. Another, with like Cavities and Crusts, only the interior thick Crust in this is striated. From the same Mines.

0. 51. Another, little different from 0. 42. only the transverse Striae are scarcely so strong and conspicuous. From the same Mines.

0. 52. Another, consisting of only one Crust, an Inch in thickness, striated, black, and shining. The Surface of this is rough and porous. From the same Mines. This has a Cast towards Purple.

0. 53. Another, little different from the preceding, saving that 'tis redder, and its Surface smoother. From the same Mines.

0. 54. Another, within of a gritty Stone-like Substance, of an iron-grey Colour, in some places cover'd with a red Crust striated a-crofs, and rising into small globular Tubera. From the same Mines of Langborn, Cumberland.

0. 55. Another, broad, and near flat, consisting of 5 Crusts. The two exterior are red, and transversely striated: the rest black and sparkling much like a piece of Steel when fresh broken. The Cuffs being in some places a little distant'd, there are in the Intervals several Sparks of a crystalliz'd Spar, most of it of a reddish Colour. From the same Mines. The Surface rises into Pustules very thick, but they are lower and flatter than in most of the foregoing. Confer. Class. 3. c. 265.

0. 56. Two Cuffs of an Haematites, each about an Inch thick. The outer, red, pretty smooth, and striated a-crofs; the inner, black, shining and sparkling like Steel, when first broken. On the inside of this, are many small, thin, black, shining Plates standing irregularly, but generally edgewise, by each other. From still the same Mines.

0. 57. Another, little different from the foregoing. From the same Mines.

0. 58. Another, seeming to consist of many Fragments of Cuffs striated a-crofs, and irregularly placed on one another. 'Tis of a dusky rufh Colour, glossy, with a faint Cast of Red. From the same Mines of Langron, Cumberland.

0. 59. Three Cuffs of an Haematites, adhering to each other, and crofs'd with fine small Striae. They are of a dark iron Colour, with a faint blue Cast. On the Surface of the outermost, is a crystalliz'd Spar, semipellucid, and white, with a faint Tincture of red. From the same Mines.

0. 60. An Iron-Ore of a dark Colour, with a slight Cast of red. There are adhering on the sides of it, several Sparry Crystallizations hexagonal and pointed, where they had room to shoot. Some of them are diaphanous; others white; others of an iron red, very bright, shining, and polite; others not polite, but appearing as if powder'd over with an extreme fine Iron-duft. From the same Mines. This, the precedent and following Samples were taken out of Q. 3 Fissures
Figures of the Stone adjacent to the Bellies or Receptacles of the Ore of these Bellies and the Langron Mines.

0.61. Another, little different from the former. In this one of the Crystalline Shoots is very distinct, large and fair. 'Tis red, shining, and polite: only one side of it appears rougher, and as if sprinkled over with fine impalpable Iron-dust. From the same Mines of Langron.

0.62. A Body like a Red-Ochre, somewhat friable, and very thick set with very small blackish Sparks, appearing like Steel-dust. From the same Mines at Langhorn. I have a sort of Native Cinnabar from Hungary, very like this; and the Artificial, or Cinnabar of Antimony, commonly much resembles this, only in that the Sparks are commonly smaller.

0.63. Another, not so red or friable: but thick set with like blackish shining Sparks. Amongst them in some parts are Brass-like shining Sparks: in others small Spots of a lovely bright blue Colour. From the same Mines

0.64. A Tuberous Hæmatites. From Langron, in Cumberland.
0.65. Another, from the same Mine.
0.66, 67, 68, 69, 70, 71, 72, 73. Parts of Tuberous Hæmatite shewing several Varieties in the Crusts, Striation, Texture, and Constitution of this Body. From the same Mine.

0.74. Part of a very thick Crust of that sort of Iron-Ore call'd Hæmatites. From the same Mine at Langborn. 'Tis two Inches and ¼ in Diameter, and striated across. The fibrous Grain of this comes up so nearly to that of the fibrous Talc that I cannot but suspect that the fibrous Structure of these Crusts of the Hæmatites, and other like Bodies, is owing to an intermixture, of this sort of Talc, with the Iron in these, and the various other Matter that constitutes those other Bodies, in the Formation of them.

0.75. A small Body, appearing to be of the Hæmatites kind. Dug up about three Miles from Penfance in Cornwall. Dr. Coamans. He informs me that this sort has been lately discovered there in considerable Quantity.

0.76. A plated Hæmatites. From Langron in Cumberland. Concerning their Plates, see the Account of that Mine, p. 24.
0.76*. Another, with small Tubera arising out of it. From the same Mine.

0.77. Another, from the same Mine.
0.78. Another, from Rill the same Mine. This, betwixt the Crusts of Hæmatites, has a parallel Crust of Spar.

0.79. A Piece of Iron-Ore, with Efflorecencies, of much the same Constitution with those of the Hæmatites, rising from it. There are also Sparks of Spar appearing in several Parts of it. From Mr. Steel's Mine, which is about two Miles distant from the great Mine, at Langron, in Cumberland. There is, in this, a Crack, which seems to have been a Shrink, or Contraction, in the
the Body since 'twas first form'd. Of these Shrinks, see the Account of the Ludus Helmontij, Class 4, supra.

o. 80. A Piece of Iron-Ore, black, with a Caft of red, glossy, and shining. It somewhat approaches the Hæmatites. From Farnes in Lancashire.

o. 81. A Mafs of Iron-Ore, extremely fine, with Efflorescencies and Tubera so rich that they very nearly approach the Constitution of Native Iron. Found in a perpendicular Fissure, in the middle of the Skrees, a vast high Mountain in the Estate of the Duke of Somerset, in Wadkale, in Cumberland. This fort is very rare; but, in the Veins and Fissures of this Mountain, there is a considerable Quantity of good Iron-Ore, tho' it be not search'd after, or work'd.

o. 82. Another Piece, very rich, in which Part of the Ore shot into quadrilateral Pyramids, the Figure of the Tin-Grains, as if there was some of this Metal likewise in the Mafs. From the same Vein.

o. 83. A Piece of Iron-Ore, approaching the Hæmatites, very hard, close, ponderous, and rich, of a flinty Constitution, and striking Fire very freely. From the same Fissure, in the Skrees. Vid. o. 101, infra.

o. 84. A Piece of Iron-Ore, not quite so hard as the foregoing, but very rich; of a dusky red Colour; with an intermixture of a whitish glossy Spar. From still the same Fissure, in the Skrees Mountain.

o. 85. A Piece of Iron-Ore, with Tubera, Shoots, and Efflorescencies, very fine. Taken out of a perpendicular Fissure near the top of a very vastly High Mountain, about half a Mile from Longthwaighe-Gill in Cumberland. This Vein holds a great deal of very good Iron-Ore: but 'tis not known, or work'd. The Efflorescencies in this Sample, are not to be compared with several that I observed, in some Parts of the Ore of the same Vein; but they were so tender and brittle that I could not easily preserve them. They arose, like Vegetables, with a single Stem; which parted afterwards into several Branches. I observed of all Sizes of them, to the Height of near two Inches. The Stems were round: and the Branches; only these, towards their Extremities, were jagg'd in such a fort, that they there resembled the common Heath. They were exactly of the Complexion of Iron, a dusky red, with a Caft of blue.

o. 86. Another Sample, with Efflorescencies not less observable. From the same Vein, or Fissure, in the Skrees Mountain.

o. 87. Another, very fine, and rich; from the same Vein.

o. 88. Another, from the same Vein.

o. 89. Another, from still the same Vein.

o. 90. A Piece of Iron-Ore, extremely rich, and very hard, of a Steel Complexion; with an intermixture of Sparks of Spar. From a perpendicular Fissure in the Skrees, about a Mile distant from that mention'd o. 81. The Ore got lately at Fritching, near...
I*, car Whitehaven, is of much the same fort: but poorer and more stoney.

0.91. Iron-Ore, of a blackish Cast, from Newcastle under Line; Staffordshire.

0.92. Another, not much different. Suffix.

0.93. Iron-Stone, of a dusky red Colour; with an intermixture of a glossy Spar, having in it several small Bodies of that fort that are commonly called Screw-stones. From _____ Mines, near Winander-Meer, in Lancashire.

0.94. Iron-Ore, of a middle Nature betwixt the Clayey and Stony fort. From Langron-Mine, Cumberland.

0.95. The soft, or Clayey Iron-Ore, from Langron, Cumberland.

0.96. More of the same, somewhat softer, and work'd up into a Ball of the bigness of an Hen's-Egg. They commonly make up this fort into this Form: and sell it for the Smitt, as they call it in the North, or Marking of Sheep: For which Reason also they call it Smitt. This is uncious or oily: as are most of the Bodies in the Langron-Mine, whence this came. This is used by Painters: and makes a Red, little inferior to the Indian Red-Earth.

0.97. Like Clayey Iron-Ore. Found in the Skrees, in the same Fissure with 0.81. This is the finest of the Clayey-Ore: and, thus made up into Balls, they use this also for marking of Sheep, and call it Smitt. The Miners call it the Mother of the Mine.

0.98. A Mafs of a deep grey Colour, bright, sparkling and very much like Steel, where broken, only the Grain is somewhat larger. I have not try'd it: but it seems to hold Iron. From Temple, Cornwall. 'Twas part of a Load, three Foot over, and running North-West and South-East.

0.99. A black glossy Iron-Ore, having in it a little Spar, white, with a Cast of red. From Mulberry-Works, in Lanewet, Cornwall.

0.100. A Mafs somewhat larger, and of a Grain more smooth and fine, otherwise of much the same Colour and Composition with that 0.41. supra. Found among Pebles, near Penwith, Cumberland. Lord Bishop of Carlisle. This appears plainly to be a Shead-flone, born from some very rich Iron-Vein.

0.101. A Piece of Iron-Ore, of a dark Liver Colour. It breaks like a Flint; and its Composition is near as compact and fine. On one side, in a small Cavity, is a bright sparkling Spar. Newent, Gloucestershire. It strikes Fire, as that 0.83. supra, does.

0.102. Part of a Nodule, flat, and almost square. 'Tis near an Inch in Thicknese: four Inches over one way, and above three another,
another, where it has been broke. In the middle is a Matter pretty hard: grey, with a Cast of yellow. This is inveted with a Cruft of a deep red Colour: and, without all, is a Cruft of a Colour more dusky and near black. Betwixt the two Crufts is a fine yellow Ochre. This Body is nearly ally'd to the Iron Ores. o. 5. 6. and 7. supra. and indeed both thofé and this to the Geodes, and mineral Bezours. Found among Marl, near Hunton, in Kent, in the Pit mention'd by Dr. Halley, Philosophical Transactions, N° 155. p. 463. Thefe Bodies are found in that Pit but sparingly: but are got 10 or 12 Miles off, at greater plenty: where they are smelted, cast into Guns, wrought into Bars, &c.

o. 103. Iron-Stone, the Colour dark grey, near black; of a Constitution much like that o. 3. supra. From ---- in Staffordshire.

o. 104. Part of a very large Mass of the ftrong Iron-Ore, from Weddesbury in Staffordshire. There are large Maffes raised of it. 'Tis very hard: and of a dark grey Colour. There are in some Parts of it Cylindric Cavities: and some of them have Pipes in them, in shape not unlike thoſe of the piped waxen Vein; but they are generally of a blackifh ferruginous Constitution. Not but that, in some Parts of the Stone, I have observ'd, in breaking of it, Spar very like the sparry Matter of the piped waxen Vein: and in others a coarser Spar, with a white light farinaceous Matter, exactly like the Lac Luna. I also observ'd, in some few Parts, Plates of a white Spar, not unlike thoſe in some of the left perfect Ludus Helmontij.

o. 105. The finer Iron-Ore, from Weddesbury. This was part of a Nodule, of the bignefs of a Man's Head. 'Twas apparently of the Texture and Composition of the Ludus Helmontij; consisting of several Tali, parted generally from one another by Intervention of that fine white dusty Matter, commonly call'd Lac Luna: but sometimes by thin Plates of a whitish Spar, very friable, and reducible to a Powder, like that of Lac Luna. And indeed this seems to be no other than that very Mineral incorporated with a very small Proportion of Cryftal. Perhaps, one sort of the coarser white Spar is made of that very Composition: I mean, of the Farina of Lac Luna incorporated with crystalline Matter. And as the one or other is superior in quantity, the Body is more or lefs diaphanous. There are other kinds of Matter that are frequently found intermix'd with Spar: but I take the Lac Luna to be the most common of any in the white Crufted Spar of Gloucefsshire. This is certain, that Lac Luna is very frequently found in the Fiffures of the Stone, in great plenty in the Quarries about Sherborn in Gloucefsshire, loose in the perpendicular Fiffures, along with the Spar: And indeed, in many of the Quarries of that, of Northamptonshire, and the neighboring Counties, as well as elsewhere in many other Parts, in the
the Quarries, and Mines*. This Specimen of Ore is part of
the out-side of the Lump, which was a Nodule, and lay loose in
the Bed. 'Twas of a shattery Constitution: and very eaily broke
to pieces. There is one of the Talil along with it.

o. 106. Part of another Core or Talus, out of the Nodule be-
fore-mention'd. These are hard and pretty rich of Iron. They
do not split with a Grain: but break irregularly and uncertainly,
like Flints.

APPENDIX to CLASS XI. PART IV.

Mineral Bodies that contain in them more or less of Iron.

SECTION I. Magnes, the Load-stone.

PREFACE.

A Load-stone that weigh'd but 11 Grains would take up a Piece
of Iron of an Ounce in weight. Sir J. Pettus's Dictionary to L.
Erckern, in Load-stone.

SECTION I. Load-stone.

† o. 1. A piece of Load-stone, of a dusky blackish Colour, with
a Cast of an Iron-Colour, and several black glossy Sparks. There
is incorporated with it a white Spar. Its Magnetick Power is
very little. From -- - in Devonshire. Mr. Robert Ball.

† o. 2. A piece of Load-stone, black, shining, and ponderous:
with a Vein of Granates in it. From - - in Devonshire. Mr.
John Walter.

SECTION II. Magnesia, Manganese.

x. o. 1. Manganese, without of a reddish rust-colour, within
more black. 'Tis porous, and not very heavy. From the Char-
ger-house Liberties, Mendip.

x. o. 2. Mangané, of a dusky grey Colour, near black: and
of a Constitution more firm, close, and hard, than the former.
From - - - upon Mendip, Somersetshire.

SECTION III. The Crustated ferruginous Bodies: Bezoar Minerale,
Geodes, Enhydros.

PREFACE.

These Bodies have generally Iron in them, more or less; for which
reason it is that they are ranked in this Place. Indeed, some of
them hold so much Iron, that they are work'd and smelted for it.
Contex. o: 1, 5, 6, 7, 102. supra.

* See some Specimens of Lac Luna in Spar, in my English Col-
lection, f. 39. i2 f. 46.
For the better distinguishing these Bodies, it may not be amiss to give the discriminative Characters of each, out of my methodical Distribution of Fossils into Classes, published at the end of my Answer to Dr. Camerarius, pag, 4. 5. Clas 2. Cap. 2. Membr. 1. Artic. 2. Sect. 5. "Stones consisting commonly of several Crusts one within another. 1. Having the Crusts close, cohering, and no Cavity within. Bezoar Minerale: or, 2. Having in them a Cavity, with Matter in it, loose, and movenable; either, first, solid, and floey, call’d a Callimus. Ætites: or, secondly, loose, as Sand, Ochre, Chalk, Earth, Geodes: or, 3. liquid, Enhydros."

The Crustated ferruginous Bodies.

4 o. 1. Enhydros. A Body of a flattish Form, and about the bigness of a Man’s Fist. 'Tis broke, and by that means two Cavities discovered within it. The bigger of them is of about the Capacity of the Shell of a Turkey-Egg: the lesfer, of about that of a Pigeon. It is constituted mainly of 3 Crusts, within one another; which easily flake and subdivide into other thinner ones. The innermost is not above an Inch in thickness: the middlemost about 3: and the exterior about ½. 'Tis, for the main, of a yellowish brown Colour: but in some Places of a darker and ferruginous Hue. This I took forth of a Stratum of Clay, in which was a great deal of fine Sand, 15 Foot deep, in Caen-Wood, betwixt Hamstead and High-gate. It had a Liquor in the Cavities of it: and is one of those Bodies the Antients called ἱνωπος.

4 o. 2. A Piece of another, little different, parted into several Cells. The Surfaces of the Crusts of this rise into Scales, and Flakes. Found with the former.

The two precedent Enhydri were found, amongst many others, in sinking the Wells in Caen-Wood; whence that Water which we call the Hamstead Water is derived, and conveyed first into great Ponds at the bottom of the Hills, in which those Wells are sunk, and from thence by Pipes to London. I was down only in one of the Wells, which they were then in digging: but I saw several of those Enhydri, with a pretty many Pyritae, amongst the Earth that was flung forth of the other Wells. They are of several Sizes, from the bigness of a Walnut, to about 2 Foot in breadth. They are generally of a compreß’d Shape: and
and lessen or grow thinner towards the Edge or Ambitus of them. Those that I saw, lay about 15 or 16 Foot deep, in a Stratum of sandy Clay: The Surfaces of that Stratum, and the Flats or larger Plains of the Enhydri lay parallel, and level. They were all hollow, and usually divided into several Cells, but these were uncertain, both as to their Number, Figure, and Capacity. The Partitions of the Cells were rarely very thick. The outer Coat was in some double, in others triple, and in a few quadruple as consisting of 2, 3, or 4 floney Crufts, involving and carrying one another. They were, for the main, of the same Constitution with those of the two described above. The Cavities or Cells were generally near full of an inipid Coagulum, or Liquor, about the Consistence of Cream, though in here and there one 'twas a little thicker. 'Twas most commonly of a greyish Colour: but in some few 'twas of a blueifh, and in others of a blackifh Hue.

+ 0.3. Another Enhydros, of an oval Shape, and near as big as a Man's Fist. 'Tis broken in two, and the Sides or Parietes of it are about half an Inch thick. In the middle of it is an oval Cavity, lined all over in an elegant manner, with a reticulated Work, the Meshes all of near the same Size, and capable of admitting a Body somewhat bigger than a Rape-Seed. Both the Reticulum, and outer Surface, are of a yellow Ochre Colour; but the inner Substance is of a darker, or ferruginous. This was found somewhere on Mendip in Somersetshire: but whether in the Calamine-Mines, or where else, I cannot recollect.

+ 0.4. Bezoar-mineral, a small Stone of a rust Colour, with an Admixture of Ochre. It consists of several Coats or Crufts inclosed one in another: and is what is commonly called the Bezoar-mineral, found on the Shore of the Sea near Outhorn in Yorkshire. It appears to have been toss'd to and again by the Motion of the Sea upon the Shores, which has ground away part of several of the outer Coats, and uncovered the inner ones.

+ 0.5. A Geodes, consisting of two or three Coats. 'Tis hollow, and had the Cavity filled with a rust colour'd Ochreous Powder. The Coats, where broken, appear of a dark ferruginous Colour. The Surface is very scabrous, and chop'd like the Bark of an old Tree; both that, and the inner Surface, being of a yellow Colour. 'Twas found in a Stratum of Gravel, in the great Gravel-Pit, on the East-side of Hyde-Park, without the Pale, where these Bodies are pretty commonly met with.

+ 0.6. Another Geodes, very scabrous, and hollow, made up of several very thin Coats of a ferruginous Colour, with an Inter-mixture of Ochre. From the same Gravel-Pit. The Cavity was filled with a loose brown Ochreous Matter.

+ 0.7. Another Geodes, likewise having an hollow, in the middle, filled with a loose yellowish Ochreous Matter. It consists of three Crufts, the middlemost much thicker than either of the other, being \( \frac{1}{3} \) of an Inch across. 'Tis within, where broken, of
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a rust Colour: the outer Surface yellow, and prettily cover'd over with a sort of Net-work. Found in a Gravel-Pit near Newton-Green.

4 o. 9. A whitish Body, with a Caft of yellow, friable, but rather harder than Chalk, inclos'd in an hard, dusky, ferruginous Cruft, about \( \frac{4}{10} \) of an Inch in thickness. Found in a Gravel-Pit on the North-side of Oxendon, near the Church. Mr. Morton. This is a sort of Geodes.

4 o. 10. A Stone of a ferruginous Colour. Being broke one part, it appears to be a Cruft, inclosing a gritty Stone of a dark Ochre Colour. Both the one, and the other, shew some very small Sparks of a shining Talky Matter. This Body is very ponderous: and seems to contain more Iron than any of the foregoing. Found on the Sea-shores near Burlington, Yorkshire. This is referable, if to any of these, to the Bezoar-mineral. But this Body is not ordinarily so stoney and hard.

4 o. 11. A Geodes, of a ferruginous Colour, with several Cavities, having in each an Ochreous Duff. 'Tis broke, and in two of the Caverns are several small Cylinders, passing most of them across from side to side. There's one larger than the rest, being \( \frac{4}{10} \) of an Inch in length. Found in a Stone-pit at the West-end of Desborow, Northamptonshire. Mr. Morton.

4 o. 12. A Geodes, of the Bigness and Figure of a Pullet's Egg, only it is somewhat compress'd. 'Tis outwardly of a grey Colour. Being split in two, there appears in the middle an oval Nucleus, of the bigness of a Chestnut, of a light brown Colour, friable, and not unlike an Ochre. This is enveloped with a ferruginous Cruft, about one tenth of an Inch thick: and that with another, paler, and about three times as thick. Found near Wigan in Lancashire.

4 o. 13. A Geodes of an oblong Figure: and square, only a little flat. Outwardly it is of a dark brown ferruginous Complexion; and hard. In the middle is a Nucleus, grey, with a Caft of yellow; and softer. Sir George Wheeler. This is about two Inches in length. Found in a Gravel-pit near Durham, in which this sort is pretty frequent.

4 o. 14. Another of an irregular and compress'd Figure; otherwise little different from the foregoing. Sir George Wheeler. From the same Pit.

4 o. 15. Another, of an oval Figure, but flat or compress'd: and its out-side of a dark ferruginous Colour. It is composed of five or six thin Crufts; and betwixt each is a very thin Plate of an Ochreous Matter, which on one side of the Body is of a red, on the other of a yellow Colour. Within all, in the middle of the Body, is a yellowish Ochreous Matter, more soft and friable than in any of the foregoing. From still the same Pit. Sir George Wheeler. Indeed, the central Ochreous Matter hardens as it dries: and was much softer when first taken out of the Earth.
4 o. 16. Another, broke: scarcely different in any thing from that 4 o. 13. Found upon the Shores of the River Tyne, near Newcastle.

4 o. 17. Another Geodes, of an oblong Shape, about an Inch in length. It is composed of only one single Crust, about \( \frac{1}{15} \) of an Inch in thickness. This is of a very dusky red Colour: only the outside is of a brighter red. It is fill'd within with an Ochreous Dust, of a light brown Colour. Found in the great Iron-Mine at Langron, Cumberland.

4 o. 18. Another, of the bigness of a Walnut, of a very pale brown Colour, broken to shew the interior Constitution of it. 'Tis composed of one single Crust, having a dusty Matter within, of a darker Colour than that of the Crust. Out of a Brick-Clay-pit near Tatnam Court. They are very common in the Clay-pits all about this City; but the Brick-makers pick them out of the Clay; because, when they come to be heated in the Kiln, the Air, in the Cavity within, becoming rarefy'd, and expanding, breaks the Shell, and spoils any Brick that it may happen to be inclofed in. They call it Race or Rance.

4 o. 19. A Bezoar-mineral, of a Constitution harder than usual. 'Tis of a flattish Figure: and composed of several Crusts, each about \( \frac{1}{4} \) of an Inch in thickness. The outermost is of a red Colour: the next of a yellow: and so on alternately red and yellow to the Umbilicus of the Body. Harwich-Cliff.

4 o. 20. Part of a Bezoar-mineral, of a triangular Form, composed of Crusts alternately brown and white. Found in a Tile-Clay-pit, along with the Ludus Helmontij, x. d. 25. on the top of Shooters-Hill, Kent.

4 o. 21. Part of a Geodes, that was, when entire, about the bigness of a Man's Fist. 'Tis externally covered over with a ferruginous Crust, about \( \frac{1}{8} \) of an Inch thick. This was fill'd chieflly with a gross Sand, amongst which was a yellow Ochreous Matter. Out of a Gravel-pit on Hamstead-Heath, where there were several of the same sort.

4 o. 22. A Nodule of Race, of the same sort with that 4 o. 18. From a Brick-Clay-pit in the Fields, on the West-side of Hyde-Park.

4 o. 23. Another, oblong, and carrying the Appearance of a white Coral. From the same Clay-pit. Indeed, these Bodies are all tuberous, and unequal: and some have short Stems, branch'd, and not unlike Coral. I examin'd a great Heap of them that were pick'd out of the Clay by the Workmen: They were of several Sizes, from the bigness of a Pea, to that of a Hen's Egg. When the Clay is wash'd off, they are all of near the same Colour, which is a light Ash-Colour. Breaking several of them, I generally found a kind of clayey Matter in them, sometimes of a brisk, and sometimes of a dusky red Colour. After they have been long exposed, and thoroughly dry'd, this Clay comes into Form of a Dust or Powder, as 'twas in 4 o. 18. supra. Some few there
there were amongst those I broke, that, like this, had no Cavity, or clayey Matter in them.

+ c. 24. Another, from a Brick-Clay-pit in a Field, on the North-side of Soho-Square.

**Mantissa I.**

Natural Delineations, of Shrubs, upon the Surfaces of various Fossils, chiefly in black, but sometimes in brown, made by Mineral Steams.

**Dendrite s.**

*Inscripta Fossilibus Arbustorum Delineationes, ab Halituum Mineralium Ascensu facta.*

p. 1. A Piece of grey Slate, with a greenish Cast. On the middle of it stand Delineations of Shrubs, in a Row, done in black. Above and below are lesser Delineations, of the same Colour, resembling Moss; all finely exhibited. Mr. Fitz-Roberts.

From the great Slate-Quarries near Newlands, Cumberland.

p. 2. A Piece of pale brown Stone, with a Row of Shrubs on it, in black, and upon a black Ground. King's Westminster.

p. 2*. Delineations of Moss, or Shrubs, black, on a whitish Stone: got in a vast Quarry in Sella-Park, Cumberland. All the Stone of this Quarry exhibits these Delineations wherever it parts in breaking.

p. 3. A grey Flinty Pebble, with various Delineations on the Inside of it. Found by the Road in a Gravel-pit beyond Deptford, on the Brow of the Hill entering on Black Heath.

p. 4. Another, with like Delineations. Shooters-Hill.

p. 5. Another. Clapham-Common, Surrey.

p. 6. Another, white, with 3 or 4 Shrubs, of a deep brown; on the Surface of it. Greenwich-Park, Kent.

p. 7. The Shell of a Bivalve, struck out of a grey Stone, with Delineations of Shrubs very fair upon it. Stifford, Essex.

p. 8. Another, with like Delineations; from the same Place.

p. 9. A Piece of Stone, with part of the Spike of an Echinus Marinus, and several Fragments of Sea-shells inclos'd in it, with like Delineations upon them. From a Quarry near Sir Ralph Dutton's Houfe, Sherborn, Gloucefsire. The Delineations, when brought forth to the Air, in Tract of Time fade, and decay.

p. 10. & 11. Two others, from the same Quarry, with like Fragments of Shells and Delineations upon them.

p. 12. & 13. Two pieces, of a very hard grey Flint, that were originally one, joining with a kind of natural Seam, at which they divided and parted. The Surfaces that were contiguous, have several very fair and large Delineations of Shrubs upon them. Those on the Surface of the one Piece are of the same Form, and Bigness, and stand at the same Distance, that those do on the Surface of the other. Found by Guilford in Surrey, whence they
they were sent to Rome, and presented to S. Ag. Scilla, who sent them back to me.

**Mantissa II.**

*Scoria, Slags, and Vitrifications of Metals.*

q. 1. A glafty Body, with Veins, or rather Crufts, of green straw-colour, and pellucid, included one in another, exactly in manner of some Agats.

q. 2. Another, of a very deep green approaching black.

q. 3. Another, black. From the Lead-smelting-Works, near Worksworth in the Peak.

q. 4. Another, black. From the Lead-Works at Chiton, on Mendip, Somersetshire.

q. 5. Another, likewise black. From the Tin-works at in Cornwall.

q. 6. A piece of coarse brown Slag, seeming to be of Copper. There are great Heaps of this found on a Tenement call'd Stone, lying two Miles South-East of Chumleigh, Devonshire, near the Ruins of a Building; which, according to the Tradition there, was a Palace of a Saxon King. There's now no Mine or Forge near. I am not positive, that this, and the two following, are certainly Slags. Though they have much the Aspect of Slags, they may possibly have been natural Nodules: which I the rather note, because there are no Forges near any of the Places where these three are found.

q. 7. Another, of a dusky Colour, near black. There are of these frequently plowed up in the Fields of Weldon, Northamptonshire. Mr. Morton.

q. 8. Another, little different. Found amongst others very plentifully in plowing in the Fields near Deau, Northamptonshire. Mr. Morton.

q. 9. A flaggy Scoria taken off the Surface of the Lead, smelted out of Caudbeck-Ore, Cumberland. I never saw the like in other Lead-Works: but 'tis constant here. Observing it to be very ponderous, I suspected there was Metal in it: and making trial, I got a considerable Proportion of Lead out of a Piece of this sort.

q. 10. A Slag, taken out of the bottom of the Hearth of the Lead-smelting-Works at Newlands, Cumberland. They use there the Copper-Slags, that remain of the Hochstetters-Works, as a Flux to promote the Fusion of their Lead-Ore.

q. 11. A Copper-Slag, from the Remains of the Hochstetters-Works, near Kefwick, Cumberland.

q. 12. Melted-Iron, from the Works at Cleter near Langren in Cumberland. The Undertakers pretended they run it with Sea-Coal; but, upon breaking this Piece, and some others, in which I found Pieces of Charcoal, I discover'd their Deceit.
§. 13. A Regulus; run out of black Lead, of the finest sort powder’d, without any Flux.

**Mantissa III.**

Miscellany Instances of metallic and mineral Bodies that have been wrought; and that give some light to natural History.

**Extract.**

1. No Growth of Metals in Ore exposed to the Air. Nor in Ore long since cast aside in the Mines under Ground. Nor in the Slags remaining of ancient Works.

2. Of Dr. Meara’s mistaking Quicklime for a native Mineral, and imagining it to be the Cause of the Heat of the Baths of Bath.

3. Blue Vitriol found adhering to the bottom of a Furnace that had serv’d for calcining Copper Marcasites.


5. Litharge.


7. An Oil out of that Pitch resembling Petroleum.

**Mantissa III.**

Miscellanea, Históriam Metallorum & Mineralium quorumdam, artès elaboratorum, specíantia.

r. 1. Three Masses of the dress’d Copper-Ore that was left in the Field unsmelted, by the Germans, Hochfietters, when they desisted and quitted the Works of Goldscalf, about the Year 1630. There are several Heaps of these; and some very large. The Ore was broken and reduced small; but having lain exposed to the Air and Rain, the Salts in the Marcasites liquating, clotted and united the broken Ore in this manner into one Mass. These were Parts broke off the outsides of the Heaps; the interior Parts are harder and more firmly combined; they are likewise richer, and have more Copper in them; the Salts having dissolved a great deal of the Metal; which, partly by reason of its Gravity, and partly because of the smallness of its Parts, made its Way along with the Water that fell in Rain, to a greater depth in the Heap. Such a Removal of the Metal out of one part of the Mass, and collecting of it in another, is what has misled some Writers, and given umbrage to an Opinion, that there is a growth of Metal in Ore exposed to the Air. But tho’ this Ore happens thus to clot and combine, some sorts there are, both of Copper, Lead, and Tin, that lie in Clay, Shiver, and lax Spar; that the Weather loosens; and opens the parts of, after they have been long exposed to it. So that in these, the Ore that before could not be parted in washing, is, by this Means, in tract of Time, brought to such State as to render it separable; and is frequently after some time washed and smelted to Profit. Another Accident there is, that has given
as much ground to this Error, of the Production and Encrease of Metals, while exposed to the Air, as either of the former. This is, those who wrought the Veins anciently, when they were numerous, full, and the Ore rich, neglected and cast aside the poorer Ore. And this being work'd at this day to considerable advantage, has made some imagine, the Ore has grown since 'twas cast aside. Nay, there have been those who have fancied a growth of Metal, even in the Slags that are Remains of the ancient Works; because we now run them again to Profit. But, such was the unskillfulness and carelessness of the Smelters of those Times, they frequently left a considerable share of Metal behind in their Slags. They seem to have made their Fires not sufficiently strong and intense; so that few of their Slags are found vitrify'd. And the laxer Slags yield to the Weather, moulder, and fall to pieces; after which, the Metal may be separated from the Refuse, by washing, and so melted down.

r. 2. Lime, very white, that I collected on Lansdown near Bath. 'Twas scatter'd out of the Carriages that convey'd it to the neighbouring plough'd Lands for their Manure. I search'd thereabouts very carefully, but could find nothing else of like sort: So that there cannot well be any doubt but that this was what Dr. Meara call'd a kind of Chalk as white as Snow, which being tailed, was attended with a biting and heat in the Mouth, and being put into cold Water, raise'd an Ebulition and Heat like Quick-Lime. So that he took it to be the cause of the Heat of the Water of the Baths; and thought this a noble Discovery *. This is certain, Lime is, and has been long used for Manure of the Fields thereabouts; and 'tis frequently found drop out of the Carriages all about Lansdown, the very place where his white Chalk was found †: And his Description squares so exactly to Lime, that 'tis strange he should not know this Body was apparently nothing else. It seems, that which he saw, happened to be fresh, and gather'd before any Rain had fallen to flake it. 'Tis not well, that Gentlemen that have not duly inform'd themselves of Things the most obvious and common, should take upon them to write of those that are the most abstruse and difficult. This is what has laid the foundation of Amusements in Natural History, and Errors without end. And they, who would hereafter write well and justly, must be very cautious how far they rely upon a vast number of both Observations and Reasonings, that some of late have set forth to light.

r. 3. Vitriol blue, found adhering to the bottom of a calcining Furnace of the brassy shining Copper-Ore in Newlands, Cumberland. 'Tis known, that this sort of Ore has Vitriol in it. The Furnace had been difused for some Months; and probably, the Humidity of the Air, during that Recess, collecting there and form-

* See his Letter in Dr. Childrey's Brit. Bac. p. 40.
† Ibid. p. 39.
ing Drops, as usual, these falling brought down the Salts that had been before carry'd up by the Fire to the top of the Furnace, affix'd and crystalliz'd them there. There was about a Pound of this Vitriol; and all of it finely shot and crystalliz'd; but this has been broke and injured by Carriage. The blue Tincture was owing to Copper concreting with the Vitriol.

r. 4. A quadrangular Shoot of Allum terminating in a Point; found with several other like Shoots adhering to a side of the Vessel, in which the aluminous Liquor was set to cool after boiling, at a Crack, thorough which a small quantity of the Liquor leak'd forth. Peak, near Hackness, Yorkshire.

r. 5. Litharge.

r. 6. Pitch from Rental in Shropshire, drawn forth of the Lapis Piceus there. Conf. g. 1. supra.

r. 7. An Oil drawn forth of the Pitch above-mentioned. r. 6. They there fancy it like Oil of Amber; but in that they are much mistaken. Indeed, it does very much resemble the common black Petroleum, in Confidence, Colour, Smell, and all other Respects: and without doubt, the true native Petroleum, found floating upon the Water of some Springs, is no other than this very pitchy Substance, drawn forth of the Strata, by the Water, as it passes them in its Course to those Springs. Probably, the subterranea Heat may also contribute something to the liquating and running of it.
CATALOGUE
OF THE
ENGLISH FOSSILS
In the Collection of
J. WOODWARD M. D.

PART II.
Exhibiting the Fossils that are extraneous; the Parts of Vegetables, and of Animals, digg'd up out of the Bowels of the Earth; in particular the Shells of Sea-Fishes: as also the Stoney, Mineral, and Metallick Bodies form'd in them.

Ranged and disposed in a Classical Method, accordin to their several Kinds and Alliances; with an Historical Account of each: as likewise various Observations, and Reflections.
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I T may not be improper or unseasonable, before I The first proceed to the brief Account I am going to give of these Bodies in the following Catalogue, to take Observations notice that I began my Observations and Collections in Gloucestershire; whither I was invited by Sir Ralph Dutton, along with his Lady's Father Dr. Barwick, shire. under whose Tuition I then was, very happily, be being a Man of great Sagacity, Learning, and an Encourager of all ingenuous Studies. Here I had very generously allow'd me all Conveniences and Assurances, for the furthering of comparative Anatomy, in which I took great pains; and had all the several sorts of Brutes, of Birds, of Fishes, that this noble and plentiful Country afforded, readily brought to me for Dissection. I had here likewise, opportunity of carrying on my Botanic Studies, of which being then young, I was very fond, having the honour of an acquaintance with Sir George Wheeler, Dr. Plukenet, Mr. Doody, and some other Gentlemen, very famous for the Progress they had made in those Studies. Not that I confin'd myself so much to this part of Natural History, as not to be ready, forward, and desirous to look into any other; and the Country about Sherborne, where Sir Ralph Dutton's Seat was, and the neighbouring parts of Gloucestershire, to which I made frequent Excursions, abounding with Stone, and there being Quarries of this laid open almost every where, I began to visit these, in order to inform myself of the nature, the situation, and the condition of the Stone. In making these Observations, I soon found there was incorporated with the Sand of most of the Stone thereabouts, great plenty and variety of Sea-shells, with other marine Productions. I took notice of the like, lying loose in the Fields, on the plough'd Lands and on the Hills, even to the very top of the highest thereabouts. Nay, in many places of this Country, they lay exposed on the plough'd Lands so thick, that I have scarcely observed Pebles or Flints more frequent and numerous on the plough'd Lands of those Countries that most abound with them. This was a Speculation new to me; and what I judg'd of so great moment, that I resolv'd to pursue it thorough the other remoter parts of the Kingdom; which I afterwards did, made Observations upon all sorts of Fossils, collected such as I thought remarkable, and sent them up to London. Some others were afterwards given me by such curious and intelligent Persons, as being appriz'd of the usefulness of these Studies, turn'd their Thoughts to such Searches. Of which the chief were Mr. Stone-street, and Mr. Morton, two Men of great Learning; and the latter deservedly famous for his Natural History of Northamptonshire.
The Subjects treated of in this Catalogue, the marine, and other extraneous Bodies turn’d out of the Earth.

The Method in which they are ranged.

In the former part of this Catalogue, are set forth the Earths, Stones, Minerals, Ores of Metals, and the other Fossils of England, thus collected, that are native. In this part, I set forth those that are extraneous, the parts of Vegetables, and of Animals, more especially those that have belong’d to the Sea, that are now found at Land, and in the Bowels of the Earth.

As method is the Life of all Business and Studies, my first care was, that the Things exhibited in this Catalogue should be digested, as far as might well be, into their proper Classes, according to their mutual Affinities and Relations to each other. That was not indeed so practicable in the Vegetables, because there were commonly Leaves of Plants of several kinds in the same Mass of Stone. But for the parts of Animals, particularly the Sea-shells, which are very numerous and various, I hope the method I have disposed them into, will not be thought greatly amiss.

The Places where they were found.

As to the Places where each was found, tho’ they be generally noted, it is in most very briefly; and the particular Pit, Quarry, or Field, whence each was taken, are not always so distinctly set forth as I could wish. The reason is, most of them were collected in Countries where I was a stranger; and so not always apprised of the names of the Grounds and Tracts of Land, where I took them up. Besides, in a Journey, and travelling, I could not well allow myself to descend to more Particulars in this matter; reserving the time I had to spare, for what I thought of much greater moment, I mean, noting the Condition of the Earth, and of the Strata, not only in the places where these Bodies were found, but all others, where the Intrials of the Earth happened to be, by any means, display’d and laid open to view. For ’twas from these Observations, that I have advanced what I have since published, concerning the means by which these Bodies were brought to Land, the great Changes the Earth then underwent, the Rife of the Mountains, the Origin of Springs and Rivers, and the Formation of Metals and Minerals, with several others of not less importance.

A Collation of these fossil Bodies, with the marine; and with like Fossils found elsewhere.

For those Bodies in this Catalogue that are described or grav’d in Books already printed, I protest, so soon as I shall find leisure, to refer to the Places, as well of the Authors who have wrote of the living Shell-fish, Aristotle, Pliny, and the Antients; as Rondeletius, Dr. Lister, and others of the Moderns; as of those Authors that have set forth Museums, the Writers of Fossils, the Natural Histories of particular Countries, and others who have described or grav’d those that have been digged up out of the Earth.

If I am not so fortunate as to find Opportunity for this myself, those

(2)
into whose hands these Things shall hereafter fall, may well supply this defect; it being a thing not difficult for any one, who is Master of those Authors, and vers'd in this part of Natural History, to make those Additions, and compleat this Work.

There is another thing that may easily be supply'd; which is, making Remarks upon several Things very well worth Consideration, that yet are obvious and discernible at first view, in many of the Bodies exhibited in this Catalogue. 'Twould have been a great pleasure to me to have done this myself, could I have spare'd the Time from my Business, and other more needful Studies.

One thing I think may be asserted with great certainty, that the Bodies here set forth give even ocular Demonstration, besides the Proofs from Experiments, that those of them that appear to be of marine Origin, are really so: that they differ in nothing from those found now at Sea: and exhibit in themselves plain Marks that they were all originally brought thence.

Then there are various Phenomena, exhibited by them, that as plainly shew, that when they were so brought forth at the Deluge, the Earth was destroyed, all the Solids of it, Metals, Minerals, Stone, and the rest, dissolved, taken up into the Water, and there sustained along with the Sea-Shells, and other extraneous Bodies: till, at length, all settled down again, and form'd the Strata of the present Earth. The Shells, and other extraneous Bodies, being thus lodg'd amongst this stoney, and other mineral Matter, that afterwards became solid, when this comes now to be broke up, it exhibits Impressions of the Shells, and other Bodies lodg'd in it; shewing, even the hardest of it, to have been once in a State of Solution, soft, and susceptible of Impression.

These marine Bodies are thus found to the tops of the highest Mountains, to the bottoms of the deepest Mines: and this, as appears from the Catalogues of the foreign Fossils, with the Observations which I have caus'd to be made abroad, on all sides of the Globe; which shews the Dissolution to have been universal.

Other Phenomena there are of these extraneous Fossils, that prove, that this Havock and Destruction was began in all Parts at the same Time, carry'd on, and finish'd in the same Manner. When the Shells, thus lodg'd in the Earth, that happen to have been well preserved, come to be broken and examin'd, they are found ordinarily fill'd with metallic and mineral Matter, with

Remarks upon the Bodies in this Catalogue.

Some of the Ufes of this Collection, e. gr. to shew that the Fossil Shells, &c. are really marine,

That when those Shells were thus re-posted in the Stone, &c. all was in a State of Solution. Hence the Impressions of Shells in Stone, and other solid native Fossils.

That there has been a total Dissolution of the Earth.

That the whole Globe was dissolved all at the same time.

That the Conchæ and other stoney Bodies
That there happened certain Tranflocations at the Deluge; the Matter consisting animal and vegetable Substances, which many Instances in this Catalogue give ocular proof of, and in such manner as to shew these several hard Substances were dissolved, and cast in these Shells, as in fo many Plasms or Moulds; they resembling the insides of the Shells with as much exactness as Metal, Wax, or any other Matter melted and cast in them, could ever possibly have done.

These afford Evidence of Sense, that tho' the Shells, in which they were formed, be perished since, and gone; this was the true Origin and Method of forming those Bodies, consisting of Stone, of Flint, and the like, that by reason of their resemblance of Conchas, Cochleae, Echini, have obtain'd, amongst the Writers of these Things, the names of Conchiae, Cochliæ, and Echinitæ.

That there happened certain Tranflocations at the Deluge; the Matter constituting animal and vegetable Substances being dissolved, and mineral Matters substituted in its place; there being, like Tranflocations of Metals in some Springs.

And in chemical Operations.

That some of the Shells that were lodg'd in Stone, are dissolved, conveyed away, and the Spaces left by the Shell, now vacant and empty. Such spaces...
Spaces occur frequently in Stone, exactly, in all respects, of the figure and bigness of the Shell so destroyed and carry’d away; and of this, there are various Instances in this Catalogue. Where the Water happened to carry in it, metallic, mineral, or sparri Particles, it commonly deposits them in the Space deserted by the Shell, ordinarily, till it had filled it; so that the Bodies thus form’d in those Cavities of metallic, of mineral, or of sparri Matter, must of course be of the Figure and Bigness of the Shell born forth of those Places; and of this, there are numerous Examples in this Catalogue.

Those Gentlemen who formerly made Observations, and Collections of these Things, seeing the Conchita, and other Bodies that had been moulded and form’d in the Cavities of Shells, which yet confis’d, where the Shell was quite perish’d and gone, entirely of mineral, sparri, or other like Matter: seeing likewise Bodies, of the Bigness and Form of Shells, that yet consis’d also of like Matter: and having not inform’d themselves of the manner how these were produced, it much perplex’d the Question concerning the true Origin of them; and render’d it somewhat intricate and difficult. Insumuch, that they who had happen’d to make their Observations where rarely any but Bodies of such mineral Constitution appear’d, they were forward to conclude, that all were so, mere Stones, and form’d where they were found, by I know not what Lusus of Nature there. This was particularly the Case of Dr. Lister. When he first wrote, ’tis plain from his own Accounts, he had made very few Observations but on the Bodies found in a Brook by Bugthorp, and a few others not far from the Place where he then dwelt. Now, as I suspected, and found afterwards upon Inquiry, the Shells being generally perish’d and gone, by stone Matter: and he having seen few besides such, and Stones form’d in the Cavities of Shells, since decay’d, being a Man, tho’ ingenious, and of some Learning, yet very rash, and precipitate in all his Notions he immediately pronounced all these Bodies mere Stones, and Productions of the Earth. What was worse, after he had once declared for that Opinion, he was never to be drawn from it. Indeed, Dr. Plot, and others, fell so readily into the same: and it had so universally obtained, when I first enter’d upon these Studies, that I found it difficult to prevail with learned Men to credit their Senses, and to see that there were, amongst the rest, Shells that were real: as also, to observe how the mineral Bodies, that resembled them, were form’d by them. Dr. Litter is every where positive that these are Stones, Lapides sui generis, and never any Part of an Animal*: that

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Quarries of different Stone yield us quite different Sorts or Species of Shells, not only one from another,—but from any thing in Nature besides that either the Land, salt or fresh Water doth yield us: as if the Stone was the Parent of these Bodies: and they own'd their Production, one Species to one sort of Stone, and another to another. Nay, tho' he afterwards met with plain undeniable Shells; and in a Book that he set forth a while after, has given Icons of several such: though he there expressly afferts, that he found in a black Stone, approaching the Nature of Coal, the very same Species of Shell that he found elsewhere in Iron-Stone:** and that he found another Species in Gravel, which he found also in Stone that yielded Lead, and in the Alum Rocks ††, yet he bravely continued to the last firm and unshaken in his Opinion, that different Stone yields us quite different Species of Shells: and would never be brought, to the very last, to give it up, though by his own Account, it appears to have had no Foundation, unless Coal, and Iron-Stone, were the same thing: or Gravel, Lead-stone, and the Alum-Rock. But this is but one of very many Instances that might be alledged of this ingenious Gentleman's Inadvertence and Precipitancy: Which I should scarcely take so particular notice of, but that 'tis a thing so easy to be observed in most of the Writers in natural History. The rest of the World do not much regard what they set forth; so that, where they do not fall foul on one another, their Oversights are neglected. Fill'd with the Satisfaction of their own discerning Faculties, they pass Judgment at first sight; write on, and are above being ever brought to retract it. Nay, 'tis odds but they are rather insulting others: and endeavouring to dissettle those Truths that they have established. These are the main Reasons why natural Studies, that are, of all others, of the highest Importance, are in the Confusion and Uncertainty that they are: and it brings into my Mind an Inscription mentioned by Mr. Locke, Nature fecit omnes Judices, paucos Artifices.

The Bodys set forth in this Catalogue, serve as so many Evidences and standing Proofs, as well to detect what is wrong and erroneous, as to assert what is certain and true. Here are, particularly digg'd up, out of the Earth, great numbers of Shells that differ not in any respect, from those that the Land, salt and fresh Water doth yield us. Then there are, in this Collection, very many Instances of Shells, that are of Species and Kinds as different as can be, that yet appear here actually lodg'd, all together, in the same Mass of Stone: as there are others, of the very same Species, lodg'd in Flint, in Chalk, in Stone, of various Kinds, in Sand, in Marble, and other Matter as different as can ever possibly be.

I should have been glad my Affairs had allowed me so much Leisure as to have compared all these Fossil-Shells with the marine, that are found at this day both in ours, and other remoter Seas, in order to the forming a Judgment whence each was brought hither. But that is a great Undertaking: and, after all, the Shores of England have not been yet so carefully search’d, but that we now daily find Shells that had escaped the notice of former Naturalists. That also is the Case of most foreign Shores; besides, that there are great numbers there that are never sent over hither: as there are doubtless a much greater number at the remoter bottoms of the main Seas, and the Ocean, that are never brought forth thence to light. That I take to have been the Place of the abode of the Ammonitae and Conchae anomiae; with a great number of other Kinds, digg’d up here at Land. Not but that I have seen of both those Kinds from Sea, but so few that I can take them to be only such as have stray’d and stray’d from their main residence, and been accidentally intercepted and stranded by great Storms. For, were their residence nearer the Shores, they must needs have been, at this day, obvious and frequent there. For very various Species, of those two Kinds, are found in incredibly great numbers at Land, as well in other Parts of Europe, as in this Island: and some of the Ammonitae are so vastly large, that these would soon be descry’d and found, were there any on the Shores. Those Fossil-Shells, that are not the Production of the main Deep, but such as I have been able to match with others found on the Shores, and are not the Production of our Seas, are all from the West, and of American Extral. I have not yet seen any one that was peculiar only to the East. For there are several found in the Seas of East-India, and in the Mediterranean, that are likewise found in the American Seas. The rest, digg’d up here, are of the English Seas: and before all those, that I was satisfied were such, I have prefix’d the Letter [A] in this Catalogue. Not but that there are several others that I take to have been likewise such, and really the Products of our Seas, to which yet I have not ventured to prefix that characterisick Distinction, till I had Leisure to compare them more accurately with those found on our Shores. There are particularly in the 10th Class, both Teeth, and Bones, that I am pretty sure will be found to be of Fifis of the English Seas, when they come to be examined and compared. Others there are that I believe will be found to be of American Origin.
A Catalogue of the Plants in Stone, contained in the First Classis.

A strange Plant, but not intire, or so plain as that the Kind can be distinguishing. *a*. 104. 105.

A vegetable Body with undulated Striae. *a*. 42.


A Plant not unlike the Sea-Fan. *a*. 41.

A large Plant jointed like those of the Cane-kind, and striated. *a*. 73.

Gras. *a*. 31. 60. 73. 104. 105. 106.

Cyprus-Gras. *a*. 19. 20. 23. 24. 41. 45. 73. 105.


The Flag, or Iris. *a*. 60. 61. 64. 65. 68. 69. 70. 71. 74. 75. 80. 81. 106.


Equisetum, sub Aquis repens. *a*. 73. a. 111.

A Plant, of the Stellated-kind, like the *Alperula*. *a*. 27. x. 2$. 29.

A Leaf, appearing to be of the Fern-kind. *a*. 44. Another Species of this. *a*. 2. 107.

*Fern*. *a*. 44. 46. 54. 60. 73.


*Filix mas pinnulis angustis non dentatis*. *a*. 5. 60. 61.

*Filix mas non ramosus, pinnulis parvis oblongis non dentatis*. *a*. 102.


*Filix Fæm. vulgaris*. *a*. 23. 46*. 47. 49. 50. 51. 52. 53. [101.


Fern approaching the Filicula montana Ruts muraria facie tenerofolia Pluckner Fab. 181. f. 1. a. 62.

Polypody. *a*. 8. 9. 10. 11. 60. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98.


*Osmunda Regalis*. *a*. 16. 24C. 30. 31. 32. 33. 43X. 78. 79.


Ala of a Capillary-Plant like the Chamaefilix marina Anglica Parkinson. p. 1143. *a*. 12. 81. 82. 83. 84. 85. 99. 100.


An Account of the vegetable Bodies, Rosin, Roots, Wood, Twigs, Leaves and Fruits, mention'd in the 2d Classis.

Roots of a sedgy Water-Gras. b. 18.
Roots of Fir-Trees. b. 28.
Fir. b. 26. 27. 31. 35. 37.
A resinous Matter that the Moss-Diggers call Frankincense. b. 36.
Oak. b. 30. 38. 39. 40. 41.
Yew. b. 32.
Birch-Tree. b. 21. 22. 23. 24. 25.
A Piece of a Branch of a Tree. b. 20.
Pieces of a Shrub like Hazel. b. 42. 43.
Hazel-Leaves and Twigs. b. 19*.
Juli of Hazel, Alder, &c. b. 4. 10.
Hazel-Nuts. b. 19*. 67. 68. 69.
Cones of the Larix. b. 72.
Cones of the Scotch-Pine. b. 70. 71.
A Fruit not unlike an unripe Nutmeg. b. 73.
Wood petrified. b. 45. 8cc.

Vegetables digg'd up out of the Earth.

Before I drew up the following Account of these, I took along with my own, the Judgment and Opinion of four Persons that have been very conversant with Vegetable Bodies, and are very eminent for their Skill and knowledge in Botany. These were Dr. Plukenet, Mr. Stonestreet, Mr. Buddle and Mr. Doody; and we carefully view'd and examin'd every individual Body herein mention'd.

Vegetables digg'd up out of the Earth.

CLASS I.
Leaves of Plants immers'd in Stone.

a. 1. The very strange Leaf on the Surface of this Piece of black Slate, appears to be of the Fern-kind, but different from any thing now any where growing upon the Face of the Earth, that we know of. There appear, on the Back of the Leaf, Bodies not unlike the Vesiculae of some Algaæ; but they are flat, and stand as thick as they can well by one another. They are placed in Rows, parted from each other by parallel Sulci; but in such Method, that
they fall all into a Quincunx Order. On the back-side of the Stone is an Impression of a Leaf of the same Species. This was digg'd up in Moflyn Coal-Pits, Flintshire; and sent me by Sir Roger Moflyn.

a. 2. Another like Leaf, but of a different Species. The Sulci are larger and deeper, and the Interstices of them greater, than in the former: and the Vesiculae stand at greater distance. Moflyn Coal-pits.

a. 3. From the same Coal-pits.

a. 4. Impressions of several long Bodies, appearing to be Leaves, of a reticular Texture, not unlike that of the Skin on the back of the common Snake. Moflyn Coal-pits.

a. 5. An Impression of part of the Ala of a Male-Fern of the same sort with that a. 60, having the Seed-Vessels also much as that has. There is part of the Leaf of some other differing Fern in the same Stone. From a Coal-pit in King's-Wood, near Bristol.


a. 8. A Leaf, seeming to be of the Polypody-kind. Found in the sinking of a Coal-pit in Prescott-Parish, near Wigan in Lancashire.

a. 9. A Leaf, very little different from the precedent. Wales. Edward Lhwyd.

a. 10. & 11. Two Impressions of Leaves of the Polypody-kind: and not much differing from the two foregoing. Wales. Edward Lhwyd.

a. 12. Part of the Ala of a Capillary Plant, not unlike the Chamæphilix marina Anglica Parkinsonii, p. 1143. only the Leaves of this are not serrated. Edward Lhwyd. Wales.

a. 13. A Leaf of the Ojymusa Regalis: and several Impressions of Leaves of the same sort. Also, part of an Ala of the Chamæphilix-kind. This piece of Stone lay at the depth of 60 Fathom, just above the Bed of Coal, in Mr. Mountagu's Colbery at Benwell, not far from Newcastle upon Tyne.

a. 17. This Stone being split, has on one part the Impression: on the other, the Leaf it self, of some Plant not unlike the Aloe. This, and the following to a. 73. inclusive, from the Coal-pits at Farrington, between Bath and Wells in Somersetshire. There is in this Stone either Alum or Vitriol; insomuch, that, being wetted, the Salts start, and the Stone shivers, and falls to pieces.

a. 18. Leaves, of a carinated Cyprus-Grass, probably English. Farrington Coal-pits.

a. 19. Two Leaves of Cyprus-Grass, a narrower, and a broader, different from each other, and from the precedent.

a. 20. Several Leaves of Grafs appearing to be both of the Culmiferous and Cyprus-kind. X. And on one part is an Impression of a short broad Leaf, seeming to be of the Daftylon or Paniceum-kind.

a. 21. A broad short Leaf seeming to be of the Gramen Daftylon or Paniceum-kind.
Another Leaf, of the same sort, with a slip of the Culm of the Grass it grew on, still adhering to it.

A broad short-leaved Grass, of the same sort with the two precedent.

Narrow and broad-leaved Cyprus-Grass, of the same sort with those No. a. 19. Also, an Impression of the Filix fam. vulg.

The Stalk of an Equisetum naked. * Another, seeming to be of the same sort, beset with several Rounds of Leaves, after the manner of the stellated Plants. These Leaves are short, and narrow at the end that is next the Stalk: but broad and obtuse at the other. The Rounds stand at near half an Inch distance from each other. † A Leaf of Grass of the same sort with that a. 20. x. ○ An Impression of the common Osmunda Regalis.

An Equisetum. 'Tis of the same sort with a. 24*.

b. Another of the same. The Impression of another.

c. The Impression of another. And a naked Stalk of the same sort of Equisetum with that a. 24.x.

Seems to be an Equisetum palustre breviorb. fol. C. B. Raij Synopf. p. 42. But the Leaves of this Fossil-Plant are narrower and sharper pointed.

b. An Equisetum of the same sort with the precedent.

A Plant of the Stellated-kind. There are 5 Roundels on this Stalk. They are placed at somewhat above an Inch interval. In each of these there are about 30 Leaves: and they generally at least an Inch in length. It looks at first view like an Asperula: but the Roundles appear to have grown edge-ways, rather than horizontally like those of the stellate Plants. Where all the Leaves meet at the Center, in each Round is a small circular Nodus. * An Ala of the Filix mas vulg. † Another Male-Fern, with the Pinnula more deeply indented. ○ Filix mas vulg. †† An Ala, seeming to be of the Filix min. palustr. Raij. p. 48. N. 6.

A Roundle of the stellate Plant, of the same sort with that a. 27.x.

Two Roundles of the same kind of Plant. And an Ala of the Filix min. palustr. 27.

A Pinnula of the common Osmunda Regalis. Two Equiseta, the same with a. 24. x. & *.

A Pinna of the common Osmunda Regalis. Two Leaves of the Filix Palustriris minor. a. 27. ††. & a. 29. and two small Leaves of Grass.

A Top-pinna of the common Osmunda Regalis, with an Auricle at the Stalk, as usual.

Three Pinnae, seeming to be of an Osmunda Regalis.


Part of a broad flat long Leaf, appearing to be of some Iris, or rather an Aloe; but 'tis striated without. Within little
appears besides Stone, of the same sort with that of the Stratum in which it lay. Probably the medullar or interior Part of the Leaf being succulent, lax, and tender, 'twas partly dissipated, and partly was absorb'd and lost in the stoney Matter that insinuated it self into the Leaf.

a. 37. Another thicker.

a. 38. Two Leaves of the same sort with the precedent, contiguous to each other, and seeming to be broke off just at their Rise from the Root.

a. 39. Part of another, with larger Striae.

a. 40. Part of another, with like large Striae. This is broader than any of the precedent.

a. 41. Part of a reticulated Plant, not unlike some of the sorts of the Sea-Fans. Also a narrow-leav'd Cyprus Grass, of the same sort with one of those a. 19. And a broad Leaf of Grass of the Daedylon or Paniceum kind, the same with that a. 20 x.

a. 42. Part of a large vegetable Body, with undulated Striae. At certain Intervals are double Rows of pretty large Studs.

a. 43. x. An Impression of a large Pinna, of the common Of-munda Regalis *** Three Leaves seeming to be of the Trichomanes. Park. Rais Synopsis, p. 46.

a. 44. Six Leaves, appearing like those of the Trichomanes. Vid. a. 43. ***; but these lying parallel, seem rather to have been Alae of the Leaf of some Fern. Also a Leaf of a Fern, but not so plain that Judgment can distinctly be made of what kind it is.

a. 45. An Ala of the Filix mas non ramosa pinnulis angulis rarvis profunde dentatis. Ger. Rais Synops. p. 48. N. 5. This Fossil is indeed a Variety of that sort found by Mr. Dodoey in several Places near London. Along with it are two Leaves of a narrow Cyprus-Grass.

a. 46. x. An Ala of the Filix fem. vulg. very plain. ** Two Impressions seeming to be of the same. † An Ala like those a. 44. *.

a. 47. A large Ala of the Filix fam. vulg. This agrees exactly, in all respects, with that * gathered on Hamstead-Heath, xi. Juniij 1700.

a. 49, 50, 51, 52. Alae of a Fern little different from the Filix fam. vulg.

a. 53. Two Alae of the Filix fam. vulg. Equisetum, of the same sort with a. 25. supra.

a. 54. A large Ala of a Fern, somewhat different from the Filix fem. vulg.

a. 55. An Ala of a Fern, extremely fair and plain; different from the Filix mas vulg. in that the Pinnulae are longer, and more indented. † Is of the same sort with a. 27. † wid. a. 56. and a. 59. *

a. 56, 57. Another Ala of the same sort with the precedent; and its Impression on the Slate that was contiguous and adhering to that piece, on which the Ala is, till broken and parted from it.
a. 58. Several Alas of the same sort still. * An Ala seeming to be of the *Felix mas* Vulg.

a. 59. x. An Ala of the *Felix mas* Vulg. * An Ala of the same sort with a. 27. a. 55, & a. 56.

a. 60. A large Branch of a *Felix mas pinnulis angustis non dentatis*. It has not been yet observed growing in England. There are upon the back of the *Pinnula, Puncta feminalia* in two Rows; in which order the Seed-vessels of the Male-fern grow. On the back of the Stone are a vast miscellany of Ferns of several kinds, Polypody, Gras, Flags, &c. lying in great Confusion; and there's amongst the rest, a Body seeming to be the stalk of a Fern.

a. 61. This, till broken off, join'd to a. 60. and has on it the Impression of the large branch of the Fern above-named. On the back-side of it is a Flag.

a. 62. An Impression of a Branch, of a small Fern, approaching the *Filicula montana Ruta muraria facie tenevisolia. Flukenet. Tab. 181. f. 1. 'Tis English.


a. 64. A Branch of a Fern, nearly resembling the *Adiantum major cortandi folio, Raij Synopf. p. 49. several Impressions of Flags. a. 65. Three Alas of the same sort with the last: with 2 or 3 Leaves of the Flag-kind.

a. 66. Alas and Impressions of the *varietas Filicis maris vulg. Petrizer. Raij Synopf. p. 341*. These have the Seeds on the Backs, near the Edges of the Pinnae.

a. 67. Another Ala, of the same sort; with the Seeds in like manner.

a. 68. Two or three Leaves broken off just at the Rise from the Root, striated, of the Flag-kind.

a. 69. Part of two Flags, striated, but deeper on one side than the other.

a. 70. Impressions of both the carinated and concave side of some Flag.

a. 71. Two broad Flags, pretty smooth, lying a-croos each other.


a. 73. An Impression of some large Plant, jointed like those of the Cane-kind, and striated. An *English Equifotum*, of that sort that is termed *sub Aquis repens*. On the back-side of the Stone is a Miscellany of Fern-Leaves, and Gras, particularly a broad-leaved Cyprus Gras.

a. 74. A piece of Stone, having on it part of the Leaf of an Iris; and a small Fern appearing to be the *Dryopteris alba Dods. Park. 1135. Conf. a. 75.*

a. 75. Another Piece of Stone, broken off from the precedent, having on it Impressions of the Iris and Fern above-mentioned. From the Coal-pits at a little Village called *Street*, near *North-Byerly,*
Byerly, about three Miles from Market-Bradford, Yorkshire. They have now desisted from working in this Pit; and the Plants are found in none of the others thereabouts.


a. 77. The Impression of that Abies. The two pieces of Stone, on which are this Abies, and the Impression, were originally contiguous and united. From the Coal-pits at Street, Yorkshire.

a. 78. A piece of Stone, having on it several Impressions of Leaves single, seeming to be of the Osmunda Regalis. Also one round of the broad-leav'd Equisetum, a. 24*. & a. 25.

a. 79. The piece of Stone that was contiguous and united to the foregoing; with the Leaves of Osmunda upon it. From the same Coal-pits.

a. 80. Part of a Flag. From the same Coal-pits.

a. 81. The Impression of a Flag, and of a capillary Plant, not much unlike that a. 12. From the same Coal-pits.

a. 82. A capillary Plant of the same sort with the precedent: and from the same Coal-pits.

a. 83. A piece of a ferruginous stoney Nodule having in it 3 Leaves of a capillary Plant not unlike tho' of a. 12. but larger. Indeed they somewhat resemble the Leaves of the Osmunda Regalis, only that they are shorter. Kenton Coal-pits. These Nodules, with Leaves in them, are called Catheads, and seem to consist of a sort of Iron-Stone, not unlike that which is found very plentifully at Robinhood's-Bay in Yorkshire, and in the Rocks near Whitehaven in Cumberland: where they there call 'em Cat-Scaups, and are frequently melted with the softer Iron-Ores. These perhaps differ not much from those described by Dr. Lifer de Font. Med. by the Name, as I remember, of Minera ferri pileformis, called Ball-Mine in Staffordshire. These Catheads are found only at Kenton, which is about two Miles to the Northward of Newcastle: and Newbiggin, about a Mile to the Westward of Kenton. Those of Kenton attend the Stratum of Coal; but lie in a Bed of blue Chiver, about a Fathom thick, and have another Stratum of black Chiver of the same thickness lying under them. They are generally about 6 or 7 Fathom from the Coal. Those of Newbiggin are but 3 Fathom above the Coal. They have not always Leaves in them; indeed, not above one in five or six. When fresh taken forth, they break difficultly and irregularly; but when exposed a while to the Air, they split easily, and part at the Leaves. They are of several Sizes, from the bigness of a Walnut to that of a Man's Fist. They are found pretty plentiful: and at about the depth of 40 Fathom.

a. 84. A piece of ferruginous stoney Nodule, with several Leaves of the same sort with tho' of the precedent. Kenton Coal-pits.

a. 85. Another piece of the same Stone, and formerly united to it. It has the Impression of the said Leaves upon it. Kenton Coal-pits.

a. 86.
a. 86, 87. A Leaf, and Impression, approaching the Polypodium Kind, of the same sort with a. 8. on the two divided pieces of a ferruginous Nodule. From Kenton Coal-pits.

a. 88, 89. A Leaf and Impression of the same sort of Plant, on the two divided pieces of a like Nodule. From Newbiggin Coal-pits.

a. 90, 91. A Leaf and Impression of the same, on the pieces of another like Nodule. From the same Coal-pits.

a. 92, 93. A small Leaf and Impression of the same on the pieces of a like Nodule, but less. From the same Coal-pits.

a. 94, 95. A larger Leaf and Impression of the same, on the formerly contiguous pieces of a like Nodule. From Kenton Coal-pits.

a. 96. The top part of a Leaf of the same, but less, on part of a like Nodule. Kenton Coal-pits.

a. 97, 98. Five small Leaves of the same, with their Impressions on the piece of the Stone that was contiguous. Newbiggin Coal-pits.

a. 99. A small ferruginous stone Nodule, having on it a Capillary, rather more nearly approaching the Chama-filix Marina Angl. than a. 12. 'Tis not serrated.

a. 100. A piece of Stone with the Impression of the said Capillary on it. This tallies with the other piece, and was broke off it. These two, 9 & 100, from the same Coal-pits with the foregoing.

a. 101. A Branch of the Filix fam. vulg. or some Fern very like it. And an Impression of a Branch with Leaves a little shorter, otherwise not different. From the Coal-pits at Farrington, Somerseshire.

a. 102. An Impression of a Fern not yet described, but may be fitly called Filix mas non ramosa, pinnulis parvis oblongis non dentatis. Farrington Coal-pits.


a. 104. An Impression of some strange Plant, about 6 Inches in length, tho' not entire; and somewhat above 1/4 of an Inch broad. 'Tis not so plain, as that one may distinctly make Judgment of it. There are with it a mighty Miscellany of other Leaves, chiefly of Grafs, lying in a confused and disorderly manner in the Stone. Farrington Coal-pits.

a. 105. An Impression of part of a Plant of the same sort with the precedent. There are also several sorts of Grafses both of the Cyprus and Culmiferous Kinds, some with broader, others with narrower Leaves. Farrington Coal-pits.

a. 106. A very thin Leaf striated, and long like a Flag, with a Leaf of Grafs lying a-crofs underneath it. Farrington Coal-pits.

a. 107. A broad flat Body sulcated with 5 Sulci, at 1/4 of an Inch distance from each other. 'Tis not much unlike a. 2. Farrington Coal-pits.

a. 108.
a. 108. A Piece of a black slatey Stone, out of the Canal Coal-pits near Haigh, Lancashire. The Colliers there call it black Baft. The Colliers about Durham, and New-Castle, call this sort Plate. The Stratum of this is about a Yard thick, lies 120 Foot deep, and 30 Foot above the Canal-Coal. There is upon this Slate an Impression of a Body that hath its Surface reticulated in a Quincunx Manner, and much like what might be made by the Bark of the Branches of the common Fir, after the Leaves are fallen or stript off; that having little Flakes standing in that manner.

a. 109. A Branch of some Capillary Plant, something resembling the common Trichomanes, only the Pinnae are larger, in a dusky grey slatey Stone, which the Workmen call White Barth. Found 70 Foot deep, in sinking a Canal Coal-pit, near Haigh, in Lancashire.

a. 110. A Branch of a Capillary Plant, of a different Species, having the Pinnae narrower, and dentated, lodge'd in the same fort of Stone; and found in the same Stratum with the former.

a. 111. An Impression of some Species of Equifetum, upon like Stone, seeming to be of the Equifetum sub aqua repens. Out of the same Stratum. This sort of Equifetum is found here pretty commonly. I have seen Parts of it to three or four Inches in length.

a. 112. Two Leaves, of the Fern-kind, very fair, each of a different Species, on a blackish grey Slate. From Swansey Coal-pits, Glamorganshire.

a. 113. Part of a flat Body, oblong, thinning somewhat towards the Edges, near 7 Inches in length, 2 in breadth, and ½ of an Inch in thickness. The 2 Surfaces are cover'd over with a Quincunx Work, the Panes of which rise gradually towards the middle; where there is a little oblong Dimple in each. Out of the Canal Coal-pits at Haigh, Lancashire.

a. 114. Impressions of long, flat, striated Leaves; having Appearances of Joints at certain Intervals; upon a dark grey slatey Stone. The Stratum of this lay at the depth of about 25 Fathom, in Branfy-Cliff, by the Duke of Somerset's Salt-Pans, near Whitehaven. The Stratum was one Foot and ½ thick: and, upon the breaking the Stone, Leaves of Plants appear'd very thick in all Parts of it, where the Grain of the Stone was thus fine and dense. But where it happened to be more gritty, coarse, and lax, there was not one Leaf to be met with. All the following to a. 138. inclusive were taken out of the same Stratum. 'Tis observable, that those in this, and the following Pieces of Slate, to a. 117. appear to be of the same kind with those a. 36. & seqq. which were found in a Coal-pit near Farrington, in Somersetshire. And indeed, there were found 3 or 4 other kinds of Plants here, that were also found there.

a. 115. a. 116. a. 117. a. 118. a. 119.

a. 120. A Body, appearing to be like the Kernel of some Plant. All the Ala of a Leaf of the Fern-kind.

a. 121. Another Ala.
CLASS II.

Pars I.

Marsh, or Turf-Earth, having lodged in it Nuts, Twigs of Trees, and Shrubs, Grass, Sedge, &c.

b. 1. From Godalming in Surrey.

b. 2. Found in sinking a wet Dock at Deptford. vid. b. 39 & b. 63.

b. 3. From Hamstead-Heath.

b. 4. From Wilmeslow near Knutsford, Cheshire. This sort lies uppermost in the Moss, and next the Surface. It seems to be made up only of the Shives or Husks, and other parts of Juli, of Hazel, Alder, Poplar, &c. vid. b. 10. infra. The Juli are in being only in the Spring Season. There are quantities of this sort of Turf in the North parts of Yorkshire, and in the Bishoprick of Durham. It lies ever at the Surface above all. 'Tis seldom above a Foot in thickness; but extended frequently for 2 or 3 Miles together. 'Tis found chiefly on the flats of Mountains.

b. 5, & 6. From the same place. This sort lies under the former; and there are Trees lodg'd and bury'd in it. At the bottom of Wilmeslow-Marsh, they meet with a reddish Sand.

b. 7. Dug up on the Shore near Outhorn, Yorkshire.

b. 7*. Peat, the softer sort, within a Foot of the Surface. Ar-kendale.

b. 7+. Peat, the firmer sort, lying a Foot deeper than the precedent.


b. 9. Moss Earth. From Kendal.

b. 10. From Kendal also. This seems to be the chaffy parts of Juli, of Alder, &c. vid. b. 4. supra.

b. 11. From the Marshes in Windsor-Forest.

b. 12. From the Marshes in Windsor-Forest.

b. 13. From the Marshes in Windsor-Forest.

b. 14. From the Marshes in Windsor-Forest.

b. 15. From the Marshes in Windsor-Forest.

b. 16. From the Marshes in Windsor-Forest.

b. 17. From the Marshes in Windsor-Forest.

b. 18.
b. 18. Roots of a 'tedgy' Water-Grass. From the Marshes in Windsor-Forest.

b. 19. From the Marshes in Windsor-Forest.

b. 19*. Earth with Nuts, Twigs, and Leaves of Hazel. Dug up in the Isle of Wight. The Hazel Leaves were apparent and distinguishable when the Earth was first dug up and moist; but since they were opened and exposed to the Air, they are perish'd, and now hardly discernible. *vid. b. 69.

b. 19†. Peat-Earth, with numerous Roots, Culms, and vegetable Bodies in it. From a Moor near St. Anns, Cornwall. The common Turf of all the Moors, which are very frequent in Cornwall, is of this sort.

b. 19x. Peat-Earth very fine, seeming to be composed almost entirely of flakes and parts of rotten Wood. Found in the same Marsh with b. 44†. a Mile from Langron.

CLASS II.

Parts II.

Pars II.

Tarts of Trees and Shrubs found bury’d under Ground.

b. 20. Part of the Branch of a Tree found bury’d with b. 3; Hamstead-Heath.

b. 21, 22, 23, 24, 25. Pieces of Branches of a Birch-Tree found in the Peat-Mosses, in Windsor-Forest, with b. 11, &c.


b. 27. A piece Firr-wood dug up in Brigsteer-Moss near Kendal, Westmorland.

b. 28. A piece of the Root of a Fir-Tree, dug up also in Brigsteer-Marshes.

b. 29. From the Shores at Outhorn, dug up with b. 7.

b. 30. Oak which is the common Moss-wood at Wilmeslow; found with b. 5.

b. 31. Firr, from the same Mosses at Wilmeslow.

b. 32. Yew, from the same Mosses.

b. 33. Also from Wilmeslow Mosses.

b. 34. From the same Marshes.

b. 34*. Still from the same Mosses.

b. 35. A Piece of Wood appearing to be Firr. Part of it is burnt, or char’d. From Wilmeslow Mosses likewise.

b. 36. A resinous Matter found lying between the Bark and the Wood of some of the Trees dug up in Wilmeslow Mosses. They call it there Frankincense. [Resinam mittit candidam, Mastichi similem vel Thuri. Th. Barthol. Hist. 72. Cant. 5. ex Stelluto de Ligno Fossil Umbria.]

b. 37. A Piece of Firr, from the Mosses near Wiggan, Lancashire.

b. 38. Oak, from the same Mosses.

b. 39. Oak, dug up at Deptford, with b. 2 & b. 68.

b. 40. & 41. From the same Place, where were found large and entire Oak-Trees, and some other sorts of Trees likewise.

b. 42.
Two Pieces of a Shrub, seeming to be Hazel, dug up, with the Nuts, in the Isle of Wight.

From the Mosses of in Lincolnshire.

Wood, very rotten, and friable, found in pretty large Pieces lodge'd in the Stone of a Quarry at Marsham near Abington.

Wood, light, and rotten; out of a Stratum of Bituminous Earth, about a Mile from Langron in Cumberland. The Stratum in which this Wood was lodge'd was about 3 Foot thick, and lay under a Stratum of Rubble that was 10 Foot thick. There were in the said Stratum Parts of the Trunks of Trees, Leaves, Sprays of Shrubs, and other Vegetable Substances in such Quantity, that the far greater Part of the Stratum seemed to be compiled of them.

A Piece of Firr-Wood from the Peat Marsh of Scaleby, about 4 Miles from Carlisle.

Two Pieces of Wood, much impaired and decayed, with some small Quantity of a black Bituminous Matter infinuated into them dug out along with the Hazel-Nuts, in the Isle of Wight.

A Piece of Wood having manifest Marks of its having been char'd, or burnt by Fire before it was bury'd in the Earth. Dug up with the precedent. 'Tis not usual to meet with Wood thus burnt, reposit'd in the Bowels of the Earth. I have found it also in the Peat Marshes of Cheshire, and elsewhere. And G. F. de Oviedo observ'd char'd Wood in Virgin-Earth, i.e. Earth that had never been dig'd in or disturb'd, at considerable Depth in the Gold-Mines of Peru. Vid. Purchas Pilgrims. i. 5. c. 3. p. 971. c.

CLASSIS II.

PARS III.

PREFACE.

This sort of Wood is found most commonly in Strata of Gravel or Sand: and sometimes in Stone, Clay or Marl. All that I have ever observ'd of it was alter'd and increas'd in Hardness and Weight, either by Infinuation of Stony and mineral Matter during the Time that these and other Bodies were suspend'd among the dissolv'd Stony and mineral Matter, in the Water of the Deluge; or by a total Solution of the Vegetable Substance, and a Succession of Stony Mineral or Metallic in its stead. What hath been imagin'd by some, that this Alteration was made since, by petrifying Water, is without Reason, or any good Observation to countenance it. Even that which is found in Lakes, and in Rivulets, was originally lodged in the Earth at the bottom of them, and petrify'd before it was reposit'd there. In particular, a more accurate Enquiry, and Tryals, have shewn that what was formerly pretend'd of the petrifying Power of Lake Oneagh in Ireland, is not true: and the Water makes no such alteration upon any Wood that is put into it; the petrify'd Wood that is brought thence, being of that which was originally lodged in the Earth at the bottom of the Lake. Instance in the Wood brought out of this Lake, because is
is frequently insinuated upon: and more Notice has been taken of it than of any other. As to the stony Incrustation of Wood, and other Bodies, I give an Account of them in the former Part of this Catalogue, p. ---

Wood Petrified.

b. 45. Found in a Gravel-pit, near Afsley, Bedfordshire.
b. 46. From the Bank of Ruston-Brook, Northamptonshire.
b. 47. From Afsley, in Northamptonshire. This has Veins of white Spar in it.
b. 48. From Clipston-Quarry, Northamptonshire.
b. 49. From the Shores near Harwich.
b. 50. Dug up in Mr. Malcolm's Yard, at Southrey, in Norfolk. It lay about two Foot deep in a brown sandy and gravelly Soil.
b. 51. From Afsley, in Northamptonshire.
b. 52. This strikes Fire with a Steel. From Wanden-Heath, Bedfordshire.
b. 53. Out of Clay, near Tunbridge.
b. 54. Found, with other Pieces, several larger, in a Stratum of Stone in Hampnet-Quarry, Gloucestershire.
b. 55. From the Shores of Severn.
b. 56. From the Shores of Shepey-Island, Kent.
b. 57. From Northamptonshire. Mr. Morton.
b. 58. From a Stone-pit near Crick, Northamptonshire.
b. 59. From the same Stone-pit.
b. 60. From the same Stone-pit.
b. 61. Found very deep in the Stone-pits of Halstow. Mr. Morton.
b. 62. Found inclos'd in Stone, in a Quarry at Afsley, Northamptonshire.
b. 63. From a Quarry near Iflip, Oxfordshire. There was a large Quantity of it, but so rotten as hardly to be taken out entire. Pieces of Wood occur pretty commonly in the Quarries of Oxfordshire.
b. 64. Found in a Gravel-pit near Wellham, Leicestershire.
b. 65. From Llany Monach Cave, near Oswestry, Shropshire.
b. 66. From a Chalk-pit, near Cambridge.
b. 66*. A Piece of a Stick, ponderous, glossy, of the Constitution of the common Vitiolic Pyrites, as having its Pores saturated with the constituent Matter of the Pyrites. Found on the Shores, among several Pyrites, near Portsmouth. I have frequently observ'd on the Shores of the Thames, below Gravesend, and on the Sea-Shores of Kent and Essex, Pieces of Wood, some branch'd, others with Knots; and all having apparently the Grain, Fibres and Texture of Wood, that were thus alter'd by Infinition of this mineral Matter. And so great is the Quantity of this Matter in them, that when the vitiolic Salts, in some of them that I kept by me, began to start and shoot, as those in the Pyrites are wont to do when kept in a warm humid close Place, the whole Bodies fell all to pieces, and appear'd in Form of a dusky grey Powder with Salts amongst it, exactly like the vitiolic Pyrites, and with-
out the least Appearance of any Wood or Vegetable Matter amongst it. But the Compages and Constitution of that is doubtless dif-
solv'd by the Action of the Salts in shooting, as set forth above.

CLASSIS II.

Pars IV.

Nuts and other like Fruits found in the Earth.

b. 67. Hazel-Nuts, from the Shores of Outborn. Found with b. 7. & b. 29.

b. 68. Hazel-Nuts, dug up with b. 2. & b. 39. at Deptford.

b. 69. Hazel-Nuts, from the Isle of Wight, found with b. * 19. Out of many hundreds of them I have chosen these: and took care to pick some of the largest and fairest that I could. "Tis plain, at first View, that the far greatest part of them were not full grown, or near ripe. I have open'd many of them, particularly of the largest, but found them hollow, and quite empty; except only one of the largest which had the Kernel very plain, and of the usual shape, but shrunk, much smaller than usual, and hardly so big as a Vetch. Mr. Stonefreet saw it with me. Had the Kernels attain'd to any considerable Growth and Consistence before the Nuts were thus bury'd, they would have remained to this day; the Shells of many of them being firm and close, and such Kernels being, when inclosed in the Shells, more likely to be preserved in this close Earth than the Leaves of Hazel, which are frequently found. Of all the Fossil-Nuts I have ever seen, either in the North, the Isle of Wight, or any other Part of England, tho' some few, perhaps by reason of some particular Advantage of Situation and Sun, are somewhat larger; yet the generality of them appear to be of about the Growth and Condition that Hazel-Nuts usually are at the end of May or beginning of June: and the Deluge began at that time of the Year †. I have observed that the Nuts got off the Trees at that time, have not only the Bulk and Appearance that these Fossil ones have: but likewise that, if kept a while, they are in like manner hollow and empty; tho' when fresh got they be full of a soft pulpy Matter, which in time transpires and passes through the Shell. Not but that sometimes in the recent Nuts I have observed a small Kernel remaining like that mention'd b. 69. There are Nuts, that appear to have been not ripe when reposed there, dig'd up, in great Numbers, about 10 Foot deep, in an original Stratum in Miln-Clofe Lead-Mines, in Darly Parish, in the Peak. Mr. Hodgkinson, Carew in his Survey of Cornwall, p. 12. mentions Nuts found in Peat-Earth two Miles East of St. Michael's Mount.

b. 70. Six Cones of the Scotch Pine, taken out of Lindan Mofs in Cheshire. These Cones are fully spread and open'd in such manner as when they cast their Seed: and seem to be of above two Years growth upon the Tree.


b. 71.
Six other Cones of the same sort of Pine which are not open'd and of a growth later than the former by a year. The former are firm and entire, but these being younger and tenderer, are somewhat decayed. Found along with the former. These are of the Growth and Bigness that this Order usually is arrived at about the end of the Month of May.

Three Cones seeming to be of the Larix. From Cherry-Hinton Chalk-pits near Cambridge: These were not come to ripeness or maturity.

A Fruit taken out of a Stratum of Gravel in a Pit near Dorchester, Oxfordshire. Mr. Doody thinks this a sort of Nutmeg, which Fruit before it is ripe, is spongy and hollow.

ANIMALIUM PARTES EX TELLURE EFFOSSÆ

CONCHYLIA

CLASSIS I.
Conchylia univalvia.

PARS I.
Conchylia univalvia tubulosa.

SECTIO I.

Conchylia Tubulosa figura indeterminate: seu Vermiculi.

c. 1. A Vermiculus. From the Chalk-pit, near Greenhithe, Kent.
c. 2. From a Stone-pit on Cowley Common, near Oxford.
c. 3. & 4. From the Chalk-pits at Northfleet, Kent.
c. 5. From the Chalk-pit near Hastingsfield, Cambridgeshire.
c. 6. From Woodstock-Park, Oxfordshire.
c. 7. From Godslow near Oxford.
c. 8. From a Clay-pit at Lambeth.
c. 9. From the Fields by Stow on the Wolds, Warwickshire.
c. 10. From a Quarry near Farmington, Gloucestershire.
c. 11. From a Field near Bursford, Oxfordshire.
c. 12. A Vermiculus growing to a Piece of a Pinna Marina. From the great Chalk-pit at Northfleet, Kent.
c. 15. Many Vermiculi sticking to a Concha Anomia. From Winchcomb, Gloucestershire.
c. 16. Many small Vermiculi sticking to a Shell of the Tree-Oyster-kind. Found near Cowln-Deans, Gloucestershire.
c. 17. Several very large Vermiculi in a Mass of Stone, along with numerous Fragments of other Shells. Found near Oxendon, in Northamptonshire. Mr. Morton.
c. 18. A Congeries, or Cluster of Vermiculi, found in the Gravel-pit, near Oxendon-Church, Northamptonshire.

(c. 19.)
c. 19. Another Clusifer, found near Cirencester, Gloucestershire.
c. 20. Another found near Witney, in Oxfordshire.
c. 21. Vermiculi testa quadrangulari. From a Gravel-pit of a Mile West of Braybrook.
c. 22. A Congeries of small Vermiculi. From a Stone-pit, near the Mill, at Workton, Northamptonshire.
c. 23. Another from the same Place.
c. 24*. A Piece of a Tubulus, having on one side Impressions of very small Knobs upon it, set in a Quincunx Order, which Impressions it took, when growing, upon the Shell of an Echinus spatagus. From the Chalk-pits at Greenhith.
c. 24 x. Two Tubuli, twisted, having circular Fibres, very grofs and plain. They are affix'd on a Piece of a Piana Marina. From a Chalk-pit, near Northfleet, Kent.

CLASSIS I.
PARTIS I.
SECTIO II.

Conchylia Tubulosa, curva, versus unam Partem gracilejcentia, seu Dentalia.
c. 25. & 26. Two small Pieces of a grey stone Matter, with the Surface black and shining, which seem by the Shape to have been each form'd in the Shell of a Dentale. Found in a grey Lime-stone, at Folkston-Cliff, near Dover, Kent.
c. 27. Two Pieces, seeming to be Parts of the Dentale, lodg'd in Stone. From the Cliffs near Minster, in the Isle of Sheppey, Kent.
c. 27*. A Dentale, [A] out of Cowley Quarry, near Oxford. It seems to be English: and of a Species that we sometimes find on the Western Coasts.

CLASSIS I.
PARS II.

Univalvia Discoida: seu Patellae.
c. 28. A Patella, with circular Ridges about it. From the Stone-pit at Teynton.
c. 29. Another. This, the two following, and c. 35 were given me by Mr. Jackson, who died suddenly after, without having acquainted me where he found them. He was very curious: and caus'd Searches to be made after these things, in most Parts of England.
c. 30. Another.
c. 31. Another.
c. 32. A small Patella, beat out of the Stone of a Quarry near Eastling in Gloucestershire.
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C. 33. Another small Patella, found in a Stone-pit at Aulefworth, Gloucestershire.

C. 34. A small Patella mention'd by Dr. Lister in Hist. Conch. lib. 4. Fig. 28. under the Title of Patella exigua alba, cancellata, Fissura notabilis in margine. 'Twas found in Harwich-Cliff. 'Tis an English Shell, and found, at this day, upon the Coast of Cornwall and Devonshire.

C. 35. A larger. Mr. Jackson, vid. c. 29. supra.

CLASSIS II.

TURBINATA.

PARS I.

Turbinata figura compressa, clavicula seu voluta apice non eminentis.

Sectio I.

Clavicula intus recondita: seu Nautilii.

d. 1. Nautilus Gracorum. Dug up in the Clay-pit near the Wells at Richmond, Surrey. This Species is found living at this day both in several Parts of the Mediterranean-Sea: and on the Coasts of America.

d. 1*. Another, of the same Species, and found 60 Foot deep in the same Pit, fill'd chiefly with Pyrites. 'Tis broke in such a manner as to shew the interior Constitution of the Body; by which means it appears to be really and indubitably a Shell of this Species.

d. 2. Another found at neither Slaughter, Gloucestershire. I caus'd this to be faw'd in two, to shew the interior Fabric of it. 'Tis near fill'd with a grey Spar; but there are plain appearances of the transverse Partitions and spinal Fistulas of the Shell. Dr. Lister has grav'd it, L. de Buccinitis. N° 24. 25.

d. 3. This and the following to d. 10. are all of the same Species: and were dug up in the Clay-pit at Richmond, above mention'd.

d. 4. d. 5. d. 6. d. 7. d. 8. d. 9. d. 10.

d. 11. Another fill'd of the same Species, found amongst other Shells 114 Foot deep, in sinking a Well at Kensington Gravel-pits, in a Bed of blue Clay.


d. 13. Ibid.


d. 15. A Nautilus, in which the Marks of the Diaphragms appear on the out side of the Shell. vid. Museo Molfcaro. p. 179. 217. From Whitton-Cliff, Lincolnshire. It has Linear Striae running along the Back all parallel to the Voluta.

d. 15*. Two Nautiloides, or Bodies form'd in Shells of the Nautilus, composed partly of a blackish Stone, and partly of a white Spar. There are, towards the end of the first Voluta, Lines resembling Sutures, not very unlike those of some of the Ammonitae. Isle of Man, sent by Dr. Wilson Lord Bishop of that Island.
Another, less, being only the interior or central part of a body of the same species with the preceding: and found along with them. In this the lines resembling sutures are very visible throughout the whole stone.

A stone formed in the cavity of a nautilus, with bifurcated ridges cross the back. In the stone-pit of a mile north-west of Morton, Lincolnshire.

Two others less, with some degree of transparency, being composed of a brown spar. These are of the same sort with the foregoing. What the natural bulk of these are, 'tis not easy to determine, none of them being entire. Kings-Weston, Gloucestershire.

Two more of the same sort, but larger. Dug up two miles from the sea, near Weymouth.

Two stones cast in nautili having a double row of studs on each side. From Tocketer fields, Northamptonshire. Mr. Morton, who sent me one of these, has described this, but wrongly, among the ammonites. Nat. Hist. Northamptonshire, p. 227. Tab. 9. Fig. 10.

A small nautilus of a compress figure. From Folkestone-Cliff, near Dover.

CLASSIS II.

PARS I.

Sectio II.

Figura compressa, voluta uniuque conspicua: seu Ammonitæ.

Errores quorundam Scriptorum circa Ammonitas.


Testam esse statutur Rob. Hook; sed ex Nautilorum Genere Microg. P. ———

Articulus I.

Ammonitæ laves: hoc est sine strigis per latera transversi.

A small ammonita with the volute smooth and plain, from ——— Mr. Morton.

From rocks of a blue slate near Watchet in Somersetshire. Mr. Cole. This seems to be flattened by some external force, and is plainly composed of a pearly shell; much resembling that of the Nautilus Gracorum in texture and appearance. Mr. Hutchinson in the searches he made by my direction, in the year 1706, observed incredible numbers of these shells, thus flattened, and extremely tender, in shivery stone about Pyrton Passage, Lime and Watchet. All he saw were near of the same size: and he imagines them to have been young, tender, and only of some few months growth. Which is the more probable, because some of the
the Ammonitæ, found in these Parts, that are at full Growth, are so vastly great. Conf. p. 79. infra.

d. 25 * F. Found in a Marl-pit, at Althampton, Somersetshire. This Shell is gloss'd over with a brass-like Armature.


ARTICULUS II.

Ammonite lateribus Strigatis, dorso levi.

d. 26 & 27. Two Ammonite found on the Shores of Whitton, Lincolnshire. They were beat out of the neighbouring Cliffs with several other Bodies, by the Wearing of the Sea. They are well preserved; the Shells being pretty found and entire. One of the Shells is fill'd mainly with Spar, the other with Stone.

d. 28 & 29. Togs-hill, Gloucestershire, between Bath and Bristol.

d. 30. This has some Remains of the Shell. From Wick and Abum, Gloucestershire.

d. 31. This was found on the Shores of Whitton, Lincolnshire; and seems to be of the same Species with d. 26 & c. 27. as also does the following.

d. 32. From the Shores of the River Humber, near Whitton, Lincolnshire.

d. 33. Found in a Quarry, the most famous in England, for Limestone; it being very hard, and making excellent Lime, at Barrow in Leicestershire.

d. 34. A Mass of grey Stone, with several Ammonitæ in it, seeming to be of the same Species with d. 26. There are also some other small Shells in the Stone. From the Shores of Whitton, Lincolnshire.

Articulus III

Ammonite porcis seu Strigis dorsum trajicienibus.

DIVISIO I.

Strigis Simplicibus.

d. 37. Found in sinking a Well at Great Bowden, Leicestershire. Sent me by Mr. Bland.

d. 38. Two Impressions of an Ammonita in Stone. Found on the side of a high Hill about 2 Miles West of Stokeley, Yorkshire.

d. 39, 40, 41, 42, 42 *. Ammonitæ found in a Marl-pit, in vast
Wast Numbers, from the depth of 3 Yards to 18 Yards, at All-terton 3 Miles from Brettone in Somersetshire.

d. 43. The Edges of this very perfect and beautiful Shell, are surrounded with a Pyritse. 'Twas found on the Shores near Hartlepool in the Bishoprick of Durham.

d. 44. A Mass of Stone, from Whitton in Lincolnshire, with Fragments of Peccines in it, and two Ammonite. The bigger of them seems to be of the same fort with d. 26. but larger: the other of the same fort with d. 46. & 47. infra.

d. 45. Found in the Cliff near the Spaw at Scarborough, Yorkshire.

d. 46. & 47. From the Shores of Whitton, Lincolnshire.

d. 47. * Found on the Shores of Humber, near Hull.

Articulus III.

Divisio II.

Porcis seu Strigis bifurcatis.

d. 48. The Ridges in this are very much rais'd and sharp: and the Shell appears very plainly in some parts. 'Twas found near Grinstead, Northamptonshire. There adheres to it a small Ammonites of the same fort with that d. 58. infra.

d. 49. & 50. Taken out of a Bed of Clay about 250 Foot deep, near Weymouth.

d. 50. * A Segment of a Cornu Ammonis with a considerable part of the Shell still invertit. 'Tis of a lovely shining pearly Hue, rather finer than the Nautilus. Found in sinking a Well at Great-Milton, Oxfordshire. Mr. Stonestreet.

d. 51, 52, 53. Three vastly large Ammonites, dug up in the great Quarry at Portland. These lay parallel to the Surface of the Stratum in which they were lodg'd; and about 50 Foot deep.

d. 51. * From Whitby, in Yorkshire. Found in the Alum Stone, the Stratum of which is 30 Yards thick, and lies 28 Foot deep.

d. 52. x. Another out of the same Alum Stone.

d. 52. * Another from the same Place (Whitby). This has the Diaphragm at the end of the last Voluta.

d. 52. †. An Impression of another in an Alum Stone, found on the Shores near Whitby, Yorkshire.

d. 53. * A Mass of Alum Stone, with several Ammonite in it, found upon the Shores near Scarborough, Yorkshire.

d. 54. Windrush, Gloucestershire.

d. 55. Found in a Gravel-pit near Wellham, Leicestershire. Mr. Bland.

d. 56. Paynswick, Gloucestershire.

d. 57. Found on Plough'd Lands by Woodstock-Park, Oxfordshire.

d. 57. * Another from Woodston in Huntingdonshire.
d. 57†. Another, very fair, composed of a bright shining Brass-like Pyrites. It has the Diaphragm at the end of the last Voluta. Found in the Isle of Portland. Mr. Chr. Wren.
d. 58.*& 59. From ——— Northamptonshire.
d. 60. From a Quarry ¼ of a Mile North-West of Clipsham, Northamptonshire.
d. 61. This is cover'd with a shining brass-like Armature.
d. 62. Found, in a Brook, near Oxford.
d. 63. Found with the former.
d. 64. & 65. The back of these rises into a sharp Edge; but yet is crois'd by the transverse Ridges, and therefore may indifferently be placed either in this or in the next Article.

D I V I S I O III.

Ammonites frigis bifurcatis dorsum trajicientibus, umbilicati.

d. 66. This consists of a brown Spar, but has part of the Shell upon it. From——— Mr. William Cole of Bristol.
d. 67. & 68. Two Pieces of Stone struck forth of the Cavity of the Umbilici of Shells of the same sort with the foregoing. They are of a cochleated Figure: as is the Cavity in which they were found. Mr. Cole.
d. 69. An Umbilicated Ammonites, with a double Order of Studs on each side. Found near Standish, Gloucestershire.
d. 70. From Portland Quarry.

A R T I C U L U S IV.

Limbo acuminato per totum dorsum duto.

D I V I S I O I.

Limbo inter duos Sulcos erecto.

d. 70*. A very large Ammonites. From Portland Quarry.
d. 71, 72, 73. & 74. Found in Whitby Alum-Mines, along with d. 51*, &c.
d. 74 x. Another, found on the Plough'd Lands upon the Hill on which Glassenbury Tor stands, Somersetshire.
d. 74 †. Another from the same Place. This is bent in such manner that one of the Sutures was open'd by that means. It seems to have been so bent before the Stone had acquired its utmost Hardness.
d. 74 *. Found near Keynsham, Somersetshire. Vid. Camden's Brit. p. 73. & 82. Edit. 1695. This has Parts of the Shell still remaining upon it.
d. 75. Found in a Cloze on the North-side of Sherborn, Gloucestershire.
d. 76. A Segment of a pretty large Ammonites. Standish, Gloucestershire.
d. 77. A Segment with Sutures very fair and plain upon the Surface. *Sherborn North-Fields, Gloucestershire.*

d. 78. A small Segment cover'd with the Shell. 'Tis of a Pearl Colour, like that of the common Sea-Nautilus. Dug up at the great Clay-pit at Richmond, Surry.

d. 79. & 80. Found by the River Cherwell, at St. Clements near Oxford.

d. 81. This Ammonites has a double Order of Studs on each side. In a Bed of Chalk by the Road near Middle-Colinbourn, Berkshire.

d. 82. A large Segment of an Ammonites. Found on Lansdown, near Bath.

**Divisio II.**

*Dorso acuminato absque sulcis secundum Dorsum dactis.*

d. 83. Found in a Brook near Brixworth, Northamptonshire.

d. 84. From Oxendon. Mr. Morton. The Dorsum of this terminates in an Edge which is very prettily crenated or notch'd, like the Edges of the Leaves of some Plants. He has since describ'd this, Nat. Hist. of Northamptonshire. p. 225. Tab. 9. Fig. 3.

d. 85. Stone-pit near Crick.

d. 86. From Northamptonshire. Mr. Morton.

d. 86*. Another, less, very fair, with the Shell on, and the Diaphragm at the end of the last Voluta. Found in a Clay-pit, near Hannington, Wiltshire.

d. 87. Fairford, Gloucestershire.

d. 87*. From Byfield, Northamptonshire. Mr. Morton.

d. 88. Found in a Stone-pit near Clifton. Mr. Morton.

d. 89. A Mass of Stone with several of the same sort of Ammonites. From the same Stone-pit.

d. 90. A Vitrillick Aluminous Pyrites with Ammonite in it. Found in a Bed of Alum-Stone 30 Yards deep, at Peak near Scarborough, Yorkshire. [This is since dissolved, and perish'd.]

d. 91. & 92. Found at Allhampton, in the same Pit with d. 39. & c.

d. 93. Found loose on the very Top of Suffield-Hill, near Hackness, Yorkshire. This is a vast Hill, and very high.

d. 94. Found loose at the bottom of a Quarry near Nunnington, Yorkshire.

**Articulus V.**

* Sulco unico per dorsum dactlo.*

d. 95. This Ammonites I found in the North-Field of Sherborn, Gloucestershire.

d. 95*. Another, little different, only the Strigæ are not so much raised; found in the Road near Keysnasham. In this some of the Sutures open, but not so much as in d. 74†.

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*This is since dissolved, and perish'd.*
Part of the outermost 
Voluta
of another; set, on each 
side the Sulcus, with a double Row of Spikes. Folkston-Cliff, Kent.

APPENDIX.
Impressions and Fragments of Ammonites.

d. 96. An Impression of an Ammonites, found near Outborn, Yorkshire.
d. 97. Another Impression. Over-Slaughter, Gloucestershire.
d. 98. Another, very fine, found a quarter of a Mile North-West of Clipston, Northamptonshire.
d. 99. Another, found in Mr. Howard's Field, at Marston-Trussell, Northamptonshire.
d. 100. This is a very fair Impression of an Ammonites upon a Flint. From Shugborough, Warwickshire.
d. 101. Part of an Ammonites, with several Shells adhering to it. From the Shores of Humber, near Whitton, Lincolnshire.
d. 102. The Body of this Stone is worn, but part of the Shell plainly appears. From the same Shores.
d. 103 & 104. Two Pieces of Ammonites, with white Spar in their Cavities; but the Edges of both the Voluta and Diaphragms of the Shells plainly appear; both of them from the same Shores with the precedent.
d. 105. A Fragment, shewing the Diaphragms. Scarborough, Yorkshire.
d. 106. Another, invested with a pearly Shell, having the Sutures finely display'd upon its Surface. From the Shores near Whitton, Lincolnshire.
d. 107, 108, & 109. Three others, with the Sutures as fine, from the same Shores.
d. 110. Another. From Slaunton, Leicestershire.
d. 111, 112, 113, & 113*. Four Pieces of Ammonite, parted at the Sutures. From Folkston-Cliff, near Dover. These shew the Sutures, and the Joints, in a manner very clear and plain.
d. 115. A Joint of an Ammonites. From the Cliff near Whitton, Lincolnshire.
d. 116. Another, consisting of a brown Spar. From—
Mr. Morton.
d. 117. Another lesser Joint. From a Gravel-Pit, near Bedford.
d. 118. Another, from a Stone-Pit, near Desborough, Northamptonshire.
d. 119. From Folkston-Cliff, near Dover.
d. 120. Three small Joints. From a Stone-Pit on the East-side of Kirtsey, Northamptonshire.
d. 121. A Fragment, shewing the Diaphragms at each Extremity. Found near Silverton, Devonshire.
CLASSIS II.

PARS II.

Turbinata quibus Oris Margo duèn continuo ad Columellam per-tingingit. Sc. Trochi, Cochlea, Nerita.

SECTIO I.

Turbinata quorum Voluta exteriores in aciem quandam exsurgentes acuminantur: seu

TROCHI.

ARTICULUS I.

Trochi Forma compressiore.

e. 1, 2, 3, 4. Four Trochi, all of the same Species, dug up in the great Clay-Pit at Richmond, Surrey.

e. 4*. Three more of the same, join'd by a Pyrites. Out of the same Pit.

e. 5, 6, & 7. Three Copperas Pyrites, cast in Shells of the foregoing Species. From the same Clay-Pit.

e. 8 & 9. Two larger, and of another Species. From the same Pit.

e. 10 & 11. Two Copperas Pyrites, form'd in Shells of the same sort with the foregoing. From the same Place. [Dissolv'd in Tract of Time, and perish'd.]


ARTICULUS II.

Trochi Forma elatiore.

e. 13. A brown Stone, very fair, and finely cast in a Species of Trochus. Found in a Stone-Pit near Cirencester, Gloucestershire.

e. 14. Another, form'd in a Shell of the same Species. Found in a Stone-Pit at Eastington, Gloucestershire.

e. 15. A turbinated Stone, larger, being at the Basis 2 Inches \( \frac{5}{2} \) in Diameter. Found near Weymouth.

e. 16. Another, somewhat less. Found in the North-Field of Sherborn, Gloucestershire.

e. 17. Another, larger than either of the precedent. Found above 100 Foot deep, in the Chalk-Pit at Northfleet.

e. 18. Another, very fair. 2 Inches in Diameter at the Basis, and 1 Inch \( \frac{1}{2} \) in Perpendicular. Found in a Quarry in Randcomb-Park, Gloucestershire.

e. 19. Another, little different, found on the plough'd Lands in Lassington-Fields, near Gloucester.
Another. Found in a Quarry near Keynsham in Somersetshire.

A larger, found in a Stone-Pit on Shot-over-Hill, near Oxford.

The Shell of a Trochus, fill'd with Stone, and having some arenaceous Matter adhering to the Outside of it. 'Tis 1 Inch \(\frac{3}{8}\) in diameter: and about 1 Inch in perpendicular. Found in the Cliffs near Whitton, Lincolnshire.

Another larger, from the same Cliffs.

Another still larger, found near Gloucester.

A Trochites, very fair. Found near Tame, in Oxfordshire.

The Shell of a Trochus, fill'd with Stone, and having some arenaceous Matter adhering to the Outside of it. 'Tis 1 Inch \(\frac{3}{16}\) in diameter, and about \(\frac{3}{4}\) of an Inch in perpendicular. Found in a Stone-Pit, near Tetbury, Gloucestershire.

Another, of near the same Bulk, having yet part of the Shell upon it. From Whitton-Cliffs, Lincolnshire.

A small Trochus, struck out of a Piece of Stone, in the Wall of the great Park at Sherborn, Gloucestershire.

Another smaller, [A] being not bigger than a common Pea; found in Stone, about 20 Foot deep, in the Home-Quarry, Sherborn, Gloucestershire. This Species is at this Day found living in our Seas; and is figured by Dr. Lifer under the Title of Trochus pyramidalis, variegatus, Limbo angusto in summum quoq; Orbe circumditus. Hist. Conchyl 1.4. f.8. n.1.

Two larger. Southampton.

A Trochus, with the Clavicle much deprest'd, and a concave Basis, out of Stone, raised near Stiford, in Essex.

Sectio II.

COCHLEÆ.

Articulus I.

Forma compressa.

A very hard, grey, turbinated Stone, 4 Inches in Bafe; and the Volutæ, where thickest, near an Inch and a halt thick. Found in the South-Fields of Sherborn, Gloucestershire.

Another, somewhat less, of a brown Colour. There adhere to the upper part of this many Granules of a Stoney Matter, that in Tract of Time had affixed upon it as it lay expos'd to Rain, &c. on the Surface of the Earth, after the Shell, in which twas moulded, was beat off and gone; which frequently befalls all sorts of form'd Stones that lie so expos'd amongst a fine arenaceous, or a loose sparrey Matter. This was found in a Clofe of Sir Ralph Dutton, on the North-fide of Sherborn, Gloucestershire.

A Cochliæ, of the same sort of Stone, but less, being not quite 2 Inches broad. Near Dursley, Gloucestershire.

From a Cliff, near Spilton, Yorkhire. This has the Shell yet covering it.
A Piece of a reddish Stone, exhibiting a Cochlea 1 Inch \(\frac{1}{2}\) in Diameter, split horizontally. By this means, the interior part of the Shell is shewn to be fill'd with Stone of the same sort with that environs it without. Found in a Stone-Pit near Shipton, beyond Turk-Dean, Gloucestershire.

A Cochlites, about an Inch in Diameter. In the Fields near Tewkesbury, Gloucestershire.

Another, somewhat less. This is the most perfect, the Impression or Mould of the Shell being the most exquisitely taken off that ever I saw. 'Twas struck out of the middle of the Mass of a Stratum of Stone in Portland Quarry.

**Articulus II.**

*Cochlea clavicular brevi.*

This small Shell has Stripes of brown, very thick, running parallel with the Volute. 'Twas found in a Stone-Pit, near Sir Ralph Dutton's House, Sherborn, Gloucestershire.

Two more; [A] from Harwich-Cliff. They are English. Dr. Lister entitles this Species *Nerita edentulus levigatus*; though they seem rather to be *Cochlea*.

A Stone form'd in another of this kind. Barrington, Gloucestershire.

Nine, [A] of different Growth and Size, but all of the same Species; from the Tyle Clay-Pit at Richmond. This seems to be the *Cochlea sublimida* or *formo ad Basin cujuslibet orbis velut sinusculus depingitur*. Listeri Hist. Conchyl. N° 19.

Two veuccated. Clipston-Quarry, Northamptonshire.

Three, very small, with *Striae* parallel to the Volute. All found about Sherborn, Gloucestershire.

Harwich-Cliff. This is found, though rarely living at this Day, on the Coast of Guernsey. 'Tis figur'd by Dr. Lister under the Title of *Buccinum bilingue firiatum labio propatulo digitato*. Hist. Conchyl. L. 4. S. 12. N° 20.

Stifford, Essex.

Spar, cast in one of the same Species. From the same Place.

This seems [A] to be the *Cochlea rufescens, fasciis maculatis*, of Dr. Lister. Hist. Animal. Angl. p. 163. Tit. 9.

A Copperas Pyrites. Richmond Clay-Pit, Surrey. [Perished.]

Southampton.

Found in a Pit near Stawell, Gloucestershire.

The Shell, wherein this Cochlites was form'd, being dissolved before the Body was turned forth of the Stratum, is here succeeded by a grey Spar, that in Shape and Thicknefs resembles the Shell, being cast in the Cavity that the Shell before possefs'd. Sherborn, Gloucestershire. Conf. Not. ad e. 54. infra.
e. 50, 51. Found in a Stone-Pit, near Hartleborough, Northamptonshire.
e. 52. Aulfworth, Gloucestershire.
e. 53. Garlington, Oxfordshire.
e. 54. Lechlade, Gloucestershire. This, like e. 49. supra, is cover'd with a sparryan Crust in lieu of the Shell; which having been dissolv'd by Water, carrying vitriolick Salts, the same Water carrying also sparryan Particles, reposed them in the place posse'd by the Shell so dissolv'd and carry'd away; which place being of the Form and Dimensions of the Shell, the Spar filling it, must of course be so too. When the Strata are, by ploughing, or other external Agents, broke up, the Bodies inclos'd in them are turn'd forth, whether cover'd with the real Shells, in which they were cast, or with these factitious Cruffs, or with none, where the Water draining thro' the Mas of the Strata, happens to have in it no sparryan Particles.
e. 55. Cirencester, Gloucestershire.
e. 56. Broad-Relington, Gloucestershire.
e. 57. Notgrave, Gloucestershire.
e. 58. Woodstock, Oxfordshire.
e. 59, 60, 61, 62. All compress'd. Found in the great Quarry at Barrington, Gloucestershire.

**ARTICULUS III.**

*Cochlea Clavicula produciter.*

e. 62. Four, dug up in a Marl-pit at Han-ton, by the River Medway, in Kent. Sent by Dr. Halley, who formerly publish'd an Account of the Bodies dug up in this Pit. *Philos. Trans.* N° 155. p. 463.
e. 63. Two, found in a Brook near Lubenham, Leicestershire.
e. 64. Found near Eymsham-Ferrey, Oxfordshire.
e. 65. Whitton-Cliffs.
e. 65*. This has Strigae, thick set with Tubercles, running parallel to the Volute of the Shell. Found in a Quarry near Cowlin-Deans, Gloucestershire.
e. 66. Stone-pit, near Stawell, Gloucestershire.
e. 67. Clay-pit, at Richmond, Surrey.
e. 69. Four, Stifford, Essex.
e. 70. From the Shores near Whitton.
e. 70*. Six, very small. All found about Sherborn, Gloucestershire.
e. 71. Aulfworth, Gloucestershire.
e. 72. Windrush, Gloucestershire.
e. 73. Coln-Deans, Gloucestershire.
e. 74. From the great Sand-pit, near Woolwich, Kent.
e. 74*. Yaxworth-Quarry, Gloucestershire.
e. 75. [A] Four, out of a Marl-Pit, near Wiggan, Lancashire. This Species is found living, at this day, on our Coasts; and is figured by Dr. Lister under the Title of Cochlea alba densè striata orbis primi superiore parte paulo depresse. Hist. Conchyl. L. 4. Sect. 5. N° 57.

e. 76. Four vitriolick Pyrites. Sheppey-Island, Kent. [3 of these perished.]

e. 77. Eight, spirally studded. They lay about 12 Foot deep in a blue Clay, among several other sorts of Shells, in the great Sand-Pit at the West-end of Woolwich.

e. 78. Found on the plough'd Lands near Turk-Dean, Gloucestershire.

e. 79. Winchcomb-Fields, Gloucestershire.


e. 81. Out of a Stone-Pit on Shot-over-Hill, near Oxford.

**Sectio III.**

*Apertura oblonga, clavicula intus recondita. Concha Veneris.*

e. 82. A small one, [A] found in the great Clay-pit at Richmond, Surrey; appearing to be the same with Dr. Lister's Concha Venerea exigna alba Cylindracea. N° 70. Hist. Conchyl.

e. 83, 84. Two large ones, from Southampton, seeming to be form'd in Dr. Lister's Concha Veneris major leviter et dense striata. N° 71. Hist. Conchyl.

**Classis II. Pars III.**

*Turbinata sinu [ex quo Lingua exoritur] ad Columellam donata.*

**Sectio I. Artic. I.**

*Apertura oblonga Figura Pyramidalis. Rhombi.*

e. 85. Two very small Rhombi. From --- Northamptonshire.

e. 86, 87. Two others, [A] larger, very fair; one of 'em with the native Colour. Mr. Jackson, Vid. c. 29. supra. This Species is common in our West-India Islands; and I have seen of the same found upon the Coasts of Yorkshire, near Whitby.

**Artic. II.**

*Figura Cylindroide. Cylindri.*

e. 88. Six small Cylinders. Found with the precedent.

e. 88*. Two others. From --- in Northamptonshire.

e. 88*. Two larger. Norleach, Gloucestershire.
Sectio II.
Apertura subrotunda: Buccina.

Artic. I.
Sinu ad Columellam non refrato.

Divisio I.
Clavicula breviore.

e.89. From Southampton.
e.90, 91, 92, 93, 94, 95, 96, 97, 98. All found in the great Tile Clay-Pit at Richmond, Surrey.
e.99, 100. Stifford, Essex.
e.101. Richmond Clay-Pit, Surrey.
e.102. Ibidem.
e.103. White, smooth. Found with e.87 & 88.

Divisio II.
Clavicula produciore.

e.104. Two, small. Found with the precedent.
e.106. A small one, [A] of the same Species. From the same Cliff.
e.108. A Stone, seeming to be form'd in a Shell of the same kind with the foregoing. Portland-Quarry.
e.109. Taken out of a Stratum of Limestone, in a Quarry on the top of a high Hill by Thornton, 2 Miles from Pickering, Yorkshire. There appear great number of Ova of Fishes in the Stone.
e.110. Richmond Clay-Pit, Surrey.
e.111. Two Buccina. Ibid.
e.112. Five others, seeming to be of the same Species. Woolwich, out of the same Pit with those e.77. There were of the same Species dug up, along with several Bivalves, near Bromley in Kent.
e.113. Eight long turbinated Stones, seeming to be form'd in like Shells with e.112. In vast Strata of Stone in Portland-Quarry, at 15 Foot depth.
e.113*. One larger, from the same Quarry.
e.114. Found with e.86.
Sectionis II. Articulus II.

Buccina Rostrata.

e. 115. Out of Harwich-Cliff.
e. 117. From the same Cliff.
e. 118. From the Cliffs of Sheppey-Island, Kent. Turbinated Pyrites.
e. 119. Another turbinated Pyrites, ibid. [Dissolv'd and perish'd.]
e. 120. Another, ibid. [Dissolv'd and perish'd.]
e. 121. Another. Richmond Clay-Pit, Surrey. [Dissolv'd and perish'd.]
e. 122. Five Buccina. Out of the same Clay-Pit.
e. 123. Two turbinated Pyrites, seeming to be form'd in like Shells with the precedent. Sheppey-Island. [Perish'd.]
e. 124. Four Buccina, with the Clavicula longer than the precedent. From Richmond Clay-Pit.
e. 124*. Two others of the same Species. Found, with several others, about 40 Foot deep, in sinking a Well by Sir Bart. Shore's Houfe on Pinner-Hill; which is considerably higher than Harrow-on-the-Hill, as was found by an actual Survey. They lie at about 4 Miles distance. I saw several turbinated Shells of different kinds that were found along with these.
e. 125. Four Pyritæ, from Sheppey-Island, seeming to be form'd in Shells of the same Species with those e. 124, & e. 124*.
e. 126. One seeming to be of the same sort, but compres'd. Richmond Clay-Pit, Surrey.
e. 127. A Buccinum. Ibid.
e. 128. Seven, of another Species. Ibid.
e. 129. Three turbinated Pyrites, seeming to be form'd in Shells of the same Species. Sheppey Cliff.
e. 130. Buccinum. Richmond Clay-Pit, Surrey.
e. 131. Another. Ibid.
e. 132, 133, 134, 135, 136, 137. Six Buccina, much resembling the Buccinum rostratum majus, crassum, &c. Liff. Hift. Conch. No. 4. but that the Twirl in this is different from that of the others; this being an Heterostrpha, the Twirls turning from the Right-hand to the left. From Harwich-Cliff.

Sectio III.

Buccina Bilingua.

Sectio IV.

Purpura, sive Buccina rostro obliquo, testa velut ex plicis quibusdam composita.

e. 140, 141, 142. From Richmond Clay-Pit, Surrey.

Appendix.

e. 143, 144, 145, 146. From Marcham Stone-Pits, within two Miles of Abingdon.

Classis III.

Conchylia Bivalvia.

Pars I.

Aurita.

Sectio I.

Sinu ad Cardinem trigono in utraq; testa, seu Pectines.

Artic. I.

Ambitu ad Marginem subrotundo.

Divisio I.

Superficies lavi, vel saltem Stris minutis admodum & vix conspicuis inscripta.


f. 2. Found, in plough'd Lands, near Stunsfield, Oxfordshire.

Divisio II.

Striata Stris Circularibus.

f. 3. Found near Weymouth.


f. 5. Risington-parva, Gloucestershire.

f. 6. Ibid.

Divisio III.

Stris ad Cardine ad Marginem ductis.

f. 7. Fairford, Gloucestershire.

f. 8. Near Gloucester.

f. 9.

f. 10. Lechlade, Gloucestershire.

f. 11. Sherborn, Gloucestershire.

f. 12. Ibid.

f. 13. Fairford, Gloucestershire.
Two. Farmington, Gloucestershire.
1. Chalk-Pit, at Northfleet, Kent.
3. Chalk-Pit, at Greenwich, Kent.
5. Found amongst Gravel, near Henley upon Thames.
6. Coln-Rogers, Gloucestershire.
7. Stowell, Gloucestershire.

DIVISIO IV.
Superficie fulcata.

8. Found amongst gravel, near Henley upon Thames.
10. Stowell, Gloucestershire.

22. Little-Risington, Gloucestershire.
23. King’s-Weston, Gloucestershire.
24, 25. Found in the Banks of the River Welland, Northamptonshire.

f. 25*. Bowden-parva, Northamptonshire. Mr. Morton.
27. Ibid.
29. From a Gravel-Pit, near Greenhythe, Kent.
30. Woodstock-Park, Oxfordshire.
31. Found, on plough’d Lands, near Eynsham-Ferry, Oxfordshire.

32. Ibid.
33. Shot-over-Hill, near Oxford.
34. Stone-Pit, Cowley-Common, near Oxford. I observed of
the same Species by the Oxford Road, about five Miles short of
Gloucester.

35. Ibid.
36. Hanworth Gloucestershire.
36*. Another of the same Species, but less. Sherborn, Glouce-
stershire.

36*. Lechlade, Gloucestershire.
37*. A small Pecket, [A] very fair. Harwich-Cliffs. This is an
English Shell, and the same with that figur’d by Dr. Lister, Hist.
Conchyl. Lib. 3. No 27 & 28. with this Title; Pecket mediocris
latus, ex rufo variegatus, circiter viginii Stris tenuiter admodum
sariumis distinctus.

38. Hilderskill-Quarry, Yorkshire.
39. Gravel-Pit, near Ilfington, Middlesex.
40. Near Sherborn, Gloucestershire.
41. Sir Ralph Dutton’s Home-Quarry, Sherborn, Gloucester-
shire.

42. Out of a Quarry in Northleach-Fields, Gloucestershire.
43. Out of the same Quarry.

f. 51. Found in a Quarry on the top of a high Hill near Thornton, Yorkshire.

f. 52. Near Gritworth, Northamptonshire.

f. 52*. An Impression of a Peccen, very fair, upon a yellowish Flint. Found near Walthamslow.


f. 54. Trumpington-Fields, near Cambridge.

f. 55. Banstead-Downs, Surrey.

f. 56. Near Rygate, Surrey, in a Chalk-pit.

f. 56*. Chalk-Pit, Lullingston-Park, Kent. This is perfect and very fair.

f. 57. Chalk-pit, near Croydon, Surrey.

f. 58. Chalk-pit, by Greenhithe, Kent.

f. 59. Full of Flint. Chalk-pit at Northfleet, Kent.

f. 60. Ibid.

f. 61. Chalk-pit at Greenhithe, Kent.


f. 63. Chalk-pit, Northfleet, Kent.

f. 64. Chalk-pit, near Charlton, Kent.

f. 65. Chalk-pit, near Greenwich, Kent.

f. 66, 67. Chalk-pit, near Northfleet.

f. 67*. A common black Flint, form'd in a Shell of the same Species with the foregoing, with parts of the Shell adhering to it, very fair. Boxley-Hill, Kent.

f. 68. Part of this Shell being broken off, shews the common black Flint cast in it as in a Mould. There's a Mafs of like Flint concreted and form'd on the Outside of this Shell likewise. 'Twas taken out of a Stratum of Chalk near 100 Foot deep in the great Chalk-pit at Northfleet, Kent.

f. 69. Out of the same Chalk-pit.

f. 70. Out of a Quarry near Farmington, Gloucestershire.

Articulus II.

Pectines, Marginis ambitu versus unam partem longius producit.

f. 71, 72, 73, 74, 75, 76, 77. From the Cliffs of Whitton, Lincolnshire.

f. 78. Found near Scarborough Spaw.

f. 79. Shot-over-Hill, near Oxford.

f. 80. Ibid.

f. 81. Ibid.

f. 81*. Two, of the same Species with the preceding. Woodston, Huntingdonshire.

f. 82. Broadwell-Grove, Oxfordshire.

f. 83. Hampnet-Quarry, Gloucestershire.

f. 84. Out of Gravel near Chelsea-College.

f. 85. Cliffs of Humber, near Whitton, Lincolnshire.

f. 86, 87. Out of a Quarry near Sherborn, Gloucestershire.

f. 88. Aulfworth, Gloucestershire.
A R T I C U L U S III.

Pectines Figura angusta à cardine ad Marginem oblonga.

A grey Stone, form'd in a Shell of an uncertain kind, but seeming to have been a Pecten. It was found in a Quarry near the River Medway, on this side Maidstone, Kent.

S E C T I O II.

Conchylia aurita Cardine dentato, seu Sphondyli.

f. 107, 108. Found in a Stone-pit near Thorp-Malsor, Northamptonshire; and are pretty common in the Pits of that Field. This seems to be of the same Species with a Sphondylus, commonly found in the West-Indian Seas.

f. 109. From the Cliffs near Whitton, Lincolnshire.

S E C T I O III.

Conchylia aurita Cardine lævi, seu Margaritifera.

f. 111. Found in a Stone-Pit, on Cowley-Common, near Oxford.

f. 112, 113. Two Margaritifera, of an oblong Shape, out of a Quarry near Farmington, in Gloucestershire.

f. 113*. Another, left, of the same Species. From the great Quarry at Barrington, Gloucestershire.

f. 113*. Two more, of a Shape more round. From Windrush Quarry, Gloucestershire.

C L A S-
CLASSIS III. PARIS II.
Bivalvia non aurita testis imparibus.

SECTIO I.
Alterna testa plana.

ARTIC. I.
Figura lata patula, rostro brevi vel nullo, Ostrea.

DIVISION I.
Ostrea labris non crenatis.

This, and the following to f. 125*. are all of the same Species with the common Oyster.

f. 115, 116. Ibid. [A]

f. 116*. A Pair, [A] taken out of a Stratum of a sandy Marl, such as is betwixt the Valves of the Shell. Near Reading, Berkshire. There were, in the same Stratum, great Numbers more of these Shells.

f. 117, 118, 119, 120. Found [A] about 10 Foot deep in a Bed of Marl, lying over the Sand, in the great Sand-pit at the farther End of Woolwich, Kent. There were here, besides Oysters, Conchae, Buccina, and other Shells, all of the very same Sorts with those found in the great Sand-pit at the hither End of Woolwich: as also elsewhere on Black-Heath, and about Stifford, in Essex. The Stratum wherein they lie, is generally six or eight Foot thick: and the Shells in it are so numerous, and lie so close, that the Mass is almost wholly composed of Shells, there being only a very little Marl interposed. The Shells, in the Stone of Stifford, lie almost as thick in it.


f. 122*. [A] This has several fair Vermiculi Marini, and a small Oyster adhering to it. Out of the great Quarry at Barrington, Gloucestershire.

f. 123. Stone-pit, [A] near Oxford. Ostracites, a Stone form'd betwixt the two Valves of an Oyster-Shell, one of them being struck off.

f. 124. Another Ostracites; both Shells being gone: Found near the precedent.


f. 127. From Thingdon Stone-pit, Northamptonshire.

f. 128. Three Pair, and three single Shells. Found in the Brook and Fields about Marston-Twissel, Northamptonshire

f. 129. Cliffs of Humber, near Whittington.
These have all Marks upon them, by which they appear to have stuck to Shells, Stones, Shrubs, or other Bodies.

f. 136. Ibid.

f. 137. Found near Sheriff-Hutton, Yorkshire.

f. 138, 139. These two Oysters, when young affixing to an Ammonita, have taken Impressions from the Shell. Found in Ashby-Field, Northamptonshire. Mr. Sawyer, Rector of the Town.

f. 140. In a Gravel-pit, near Barly, Cambridgeshire.

f. 141. A vast thick Shell found in a Bed of blue Clay, a Mile and half East from Weymouth, 50 Foot higher than the Sea.

f. 142. Oxendon Gravel-pit. Mr. Morton.

f. 143. On a Hill near Eysham-Ferry, upon the plough'd Lands, Oxfordshire.

f. 144. In the Fields near Quainton, Buckinghamshire.

f. 146. Plough'd Lands, near Eysham-Ferry, with f. 143.

f. 147. Fulbrook, Oxfordshire.

f. 147*. Found upon an Hill near Stroud, Gloucestershire, among several others of the same Species. There is on the Cardo, the Impression of another Shell, to which this had affix'd during the Growth of it.

f. 148. Minchinhampton, Gloucestershire.

f. 149. Fields near Gritworth, Northamptonshire. The concave Shell of this and of all the following to f. 166 inclusive, have Marks of their adhesion to other Bodies in like manner as is observ'd of various kinds of Shell-Fish, now living at Sea. They affix themselves to Stones, and other solid Bodies, the better to secure themselves against the Agitations of the Water of the Sea.

f. 150, 151, 152, 153. Found in the great Quarry near Barrington in Gloucestershire.

f. 154, 155. Near Sherborn, Gloucestershire. This is the Otites of Dr. Plot.

f. 156. Near Sherborn, Gloucestershire.

f. 157. Ibid.

f. 158. Ibid.

f. 159. Tangley, Oxfordshire.


f. 162, 163, 164, 165, 166. In a Stone-pit near the Mill at Workton, Northamptonshire.


f. 167 x. Another from the Vale of Gloucester.

f. 168. Heddington, Oxfordshire.

f. 169. Richmond, Yorkshire. [Dissolv'd and perish'd.]

f. 170, 171. Whitton Cliff, Lincolnshire.
D I V I S I O II.

Oftren Marginibus dentatis Arborea dicta, quod Arboribus & Fruticibus in Littore Maris nascentibus adhære solent.

f. 172, 173, 174. In a Stone-pit ¼ of a Mile North-West of Morton, Lincolnshire.

f. 174*. Found in a Stone-pit near Peterborough.

f. 175. Three Shells. Found on Plough'd Lands near Cirencester, Gloucestershire.


f. 177. Grav'd by Dr. Lister de Conchitis, Plate 446. N° 37.

f. 178. Ipsip, Oxfordshire.

f. 179. From a Stone-pit in the Road between Kettering, and Rothwell, Northamptonshire.

f. 180. In a Stone-pit near Gritworth, Northamptonshire.

A R T I C U L U S II.

Figura angusta Rostro longo recurvo.

These are commonly call'd Conchæ rugosæ or Crow-stones, they are frequent in Italy. Bonanni Obs. Testac. p. 103. Bishop Evans of Bangor, gave me one from Angliea. I have seen of them from Leppington in Yorkshire, and the Fields near Ailsbury.

f. 181. From the Shores near Pyrton Passage, on this side of the Severn.

f. 182. From Ditchford, Worcestershire.

f. 183. Witney, Oxfordshire.

f. 184, 185, 186, 187. From the Vale of Gloucester.

f. 188, 189. From the Cliffs at Whitton, Lincolnshire.

f. 190. From the Banks of the River near Bugthorp, Yorkshire.

f. 191. Out of a Brook near Northleach, Gloucestershire.


f. 192*. Found in a Quarry at Tuerton near Bath.


f. 194, 195. The Opercula, or flat Shells, from the Vale of Gloucester.

f. 196. Pyrton-Passage over the River Severn.

f. 197. From the Cliffs near Whitchurch, Lincolnshire.

f. 198. From Bugthorp River, found with f. 190. Yorkshire.

f. 199. Plough'd Lands near Painswick, Gloucestershire.
Some of these which follow in this Catalogue, are grav'd by Dr. Lister. *Appen.* ad Hift. Conchylior. l. 3. de Conchitis. N° 13, 14, 15.

There are so great Numbers of these Shells found about Sherborn in Gloucestershire, where I was, at Sir Ralph Dutton's House, several Months, that I thought it endles to note all the Places. Those therefore, in this Section, that have not the Places noted, were all found about Sherborn, where they are call'd Pundibs: and lie as thick on the plough'd Lands, in some Fields about this Town, as I think I ever saw Pebles or Flints elsewhere.

The *Anomia laves* are also found near Wickham in Kent, Bifeter, in Caldy Island, Wales, Bridport, Dorsetshiire, in great Numbers.


**Articulus I.**

*Anomia laves.*

**Divisio I.**

*Anomia laves* Margine imo in duos Angulos terminati.

f. 200. Found in sinking a Well near Farrington, Berkshire.

f. 200*. Two from Woodston, Huntingdonshire. Mr. Morton.

f. 201. Found in Silverton Quarry, Devonshire.

f. 201†. Of Spar, the Shell moft of it struck off.

f. 202, 203. From Calverton in Leicestershire, on the Edge of Rutlandshire.

f. 204, 205.


f. 207, 208.


f. 211. Found near Oxendon, Northamptonshire. Mr. Morton.

f. 212. f. 213. f. 214.

f. 214†. Found by the River Avon, Wiltshire. Mr. Stonestreet, who says 'tis that which Mr. Lhwyd calls Sacculus longissimus. Lythphylac. p. 42. N° 872.
(46)

f. 214*. Fill'd with Spar, Oxendon, Northamptonshire.
f. 214 x.
f. 215, 216. Tags-Hill, between Bath and Bristol.
f. 217.

DIVISIO II.

Anomia laves Margine subrotundo plano.

f. 218. Two from a Stone-pit near Desborough, Northamptonshire.
f. 218*. f. 219. f. 220.
f. 221. In a Stone-pit near Stowell, Gloucestershire.
f. 222. Withington Fields near Randcomb, Gloucestershire.
f. 223. Greenwich Chalk-pit, Kent.
f. 223*. Broke out of the same Stone with $f$. 403.
f. 224. Oxendon. Mr. Morton. It seems to be of the same Species, and found in the same Place with f. 218.
f. 226.
f. 227. In the Fields near Wellingborough, Northamptonshire.
f. 228. A yellowish Flint, form'd in this Species, the Shell gone. Out of a Gravel-pit, near Ishington-Wells.

f. 229.

f. 230. Farrington, Somersetshire.
f. 231. f. 232. f. 233.
f. 234. In a Stone-pit near Stowell, with f. 221.
f. 235. f. 236. f. 237. f. 238. f. 239. f. 240.
f. 241. Twenty small ones, all found about Sherborn, Gloucestershire.
f. 241*. Two, found in a Quarry, on the side of an high Hill, near Silverton, Devonshire.
f. 241†. Two, from the same Quarry.

DIVISIO III.

Anomia laves Margine sinuato.

f. 242, 243, 244, 245, 246, 247. From the Stone-pits about Crick, Northamptonshire. These and the two following have only one Sinus. The others under this Membrum have all of 'em three.
f. 248. f. 249.
f. 253. f. 254. f. 255.
f. 256. Candlesby, Lincolnshire.
f. 257. Two adhering together from the Vale of Gloucester.
f. 258. Two more, one infix'd into the other. Out of a Stone-pit near Oxford.

f. 259.

f. 260. Grafton Quarry, Northamptonshire.
f. 261. Greenwich Chalk-pits, Kent.
f. 262. Purfleet Chalk-pits, Essex.
f. 263. Chalk-pit by Croydon, Surrey.

f. 264.
f. 264. Chalk-pits near Deptford.
f. 265. Chalk-pit at Greenbitch; the Shell empty, Kent.
f. 266*. From a Chalk-pit near Northfleet, Kent.
f. 266. In Flint, from a Gravel-pit on Hampstead-Heath.
f. 267. Filled with Flint, Deptford Chalk-pits.
f. 269. Greenbitch Chalk-pit, Kent.
f. 270. Northfleet Chalk-pit, Kent.
f. 270*. Found in a Chalk-pit on Boxley-Hill, Kent.
f. 271. Rygate Chalk-pit, Surrey.
f. 272. Charlton Chalk-pit, Kent.
f. 273. Four small, Northfleet, Kent.
f. 274. A single Valve, Chalk-pit near Greenwich, Kent.
f. 275. Another, Northfleet.
f. 276. Another small, Greenbitch.
f. 277. A very large one, Withington Fields near Randcomb, Gloucestershire.
f. 278. 
f. 279. From a Pit near Stawell, Gloucestershire, with f. 221; & 234.
f. 280. f. 281. f. 282.
f. 284. Withington Fields near Randcomb, Gloucestershire.
f. 301. Found in a Quarry on the side of an Hill near Silverton, Devonshire.

DIVISION IV.

Anomia laves. Margine subrotundo crenato.
tho' not so as to reach the Cardo, as they do in those of the following Article.

f. 320. Randcomb-Park.

ARTICULUS II.

Anomia à Cardine ad Marginem striata.

I have seen of these from Bridport, Dorsetshire. Caldy Island, Wales. Castle-Cary, Somersetshire. Chalk-pits near Guilford.

f. 321. Three small ones fill'd with the Pyrites. From the Cliffs of Sheppey Island. [These are dissolv'd, and perish'd.] The Pyrites is very apt, in tract of Time, to fall to pieces: and, by that means, I have lost some of the most elegant Bodies in this Collection.

f. 322. Another, from the same Cliffs, somewhat larger.

f. 323. Six from Dudley in Staffordshire. I take one of these to be that grav'd by Dr. Lisler. APPEN. ad lib. 3. Hift. Conchyl. de Conchitis. No 8.

f. 324. One of the Shells of this has a large Sinus: the other is prominent, and rises as much. From the Isle of Man. Dr. Wilson Lord Bishop of the Island.

f. 324, 325, 325*. Sent by Dr. Nicholson, Lord Bishop of Carlisle, from Cumberland.

f. 326. Chalk-pit, near Rygate in Surrey.

f. 327, 327*, 328. Greenbith Chalk-pit, Kent.

f. 329. Ibid.

f. 329.* Two from the great Chalk-pit near Northfleet, Kent.

ARTICULUS III.

Anomia à Cardine ad Marginem sulcata.

DIVISIO I.

Labiis in eodem Plano commissis.

f. 330. Consisting chiefly of a white Spar, most of the Shell being fiver'd off, and gone. Heddington, Oxfordshire.


f. 333. Found in the River Colne near Compton in the Hole, Gloucestershire.


f. 335. Impression in a dusky green Flint. In the Road near Pancridge.

f. 336. Impression in a grey Flint. Sydenham Common near the Wells.

f. 337. Impression with the Shell. Harrow on the Hill, Middlesex.
f. 337 a. A convex Impression, in a flinty Peble, Camberwell, Surrey.

f. 337 b. A concave Impression, very small, plough'd Lands near Oxford.

f. 337 c. Another larger, Gravel-pit, St. George's-Fields, Southwark.

f. 337 d. Another Impression of a Shell still larger, in an Agate, found in a Gravel-pit a little beyond High-gate, Middlesex.


DIVISIO II.

Margine aliquantulum sinuato.


f. 340. Four, Northfleet Chalk-pits.

f. 341. Four. From Withington Fields near Randcomb, Gloucestershire. That Body in Aldrov. Mus. p. 878. No. 3. seems to be of this sort. He ranks it very erroneously amongst the Astroïdes: as indeed he does Echinid, Cornua Ammonis, &c.

f. 342. Two, Burford, Oxfordshire.

f. 343. A convex Impression on a grey Flint. Top of Shooter's Hill, Kent.

f. 344. Concave Impression in a flinty Peble, Kentish-Town, Middlesex.

f. 345. A Shell in a flinty Peble, brown and grey, Stoke-Newington, Middlesex.

f. 346. A Piece of a flinty Peble, grey with a Cast of yellow. The whole Stone was large; but shattered to Pieces in breaking. There is lodg'd in it a small Concha Anomia, broken on one part, and having its inside thick fet with small crystalline Shoots, or Sparks. Found near Stratford, Essex. The three Agate Mocho Plates, in the first part of the Catalogue of the Fossils of England, viz. those that are Native. No. e. 21. q. r. f. p. ———— were cut off this Stone from the Shell thus lodg'd in it: it appears that this kind of Mocho Agates was dissolve'd, at the Deluge, as well as the rest, and as Flints, and other Nodules.

f. 347. Gritworth, Northamptonshire.

f. 348. Sudbury, Gloucestershire.

f. 349. Sherborn, Gloucestershire.


f. 351 x. Found about 30 Foot deep in a Stratum of Stone, near Silverton, Devonshire.

f. 352. Sherborn, Gloucestershire.

DIVISIO III.

Margine magis sinuato.

f. 353. Hedington, Oxfordshire.

f. 354. Dursley, Gloucestershire.
f. 355. Sherborn, Gloucestershire.
f. 357. Witney, Oxfordshire.
f. 358. Sherborn, Gloucestershire.
f. 359. Boldaston, Gloucestershire.
f. 360. Berkley, Gloucestershire.
f. 361. Sherborn, Gloucestershire.
f. 362. Filled with Spar, ibid.
f. 363. Another broken, so as to shew the Constitution of the Spar, Sherborn, Gloucestershire.
f. 365. Sherborn, Gloucestershire.
f. 366, 367, 368. Tog's-Hill, between Bath and Bristol.
f. 368*. King's-Weston, Gloucestershire.
f. 369, 370. Two comprest from Tog's-Hill.
f. 371*. Found near Badminton, Gloucestershire.
f. 372, 373, 374, 375, 376, 377. From Colderton, in Leicestershire, on the Edge of Rutlandshire.
f. 378. Found on the East side of Downham Gills, Yorkshire.

There were many more of the same.

f. 379. Dudley, Staffordshire.
f. 380. Forest of Dean, Gloucestershire.
f. 381. Found in the Stone-pit, at Brick in Northamptonshire.
f. 382. Two, the one inlaid into the other. From the same Stone-pits.

f. 383. Sherborn, Gloucestershire.
f. 385. Walsal, Staffordshire.
f. 386, 387, 388, 389. These have no Rostrum, but were found in Shells of the same Species with the precedent. Found near Earlington, Somersetshire.

**SECTION III.**

Sivalvia incerti Generis sed qua Anomiis Fab. Columnae accedere videntur.

**ARTICULUS I.**

Figura à Cardine ad Marginem oblonga, Rostro adunco.

f. 390. Found in a Clay-pit near Lambeth.
f. 391. Out of the same Clay-pit.

f. 392, 393, 394, 395. From the Cliffs at Folkestone, near Dover. These are here found in great Numbers: and are of the same Species with the preceding.

f. 396. Impression of a like Body, upon a Flint. Found in a Gravel-pit on Hamstead Heath.
f. 396*. Digg'd up in a Pit of Clay, used for making Tyles, in Childrens-Field, in the Parish of Thurnham, 3 Miles from Maidstone in Kent. Dr. Hatley. There were several others of the same Species.

Articulus II.

Figurà à Latere ad Latus oblongà, Rosfo brevi.

f. 397. A very large one grav'd by Dr. Lister, de Conchitis, Plate 465. Taken out of a Lead-Mine, near Worksworth, in the Peak.

f. 398, 399. Out of a Stratum of Stone, in another Mine at Worksworth.

f. 400. Another. Mr. Morton, from ————.

f. 400*. Musculo Mathioli accedens. This ought to be rank'd among the Polyleptoginym Forma oblonga. Dudley, Staffordshire.


f. 403. Dudley, Staffordshire.


f. 404. This was taken out of a Stratum of 63 Yards deep, at the bottom of one of Mr. Bathurst's Mines in Arkendale, Richmondshire.

f. 405. Found in the River near Threpland, Westmorland.

f. 406, 407. Two, on one the concave, on the other the convex Impression. Mr. Southwell, King's-Weston, Gloucestershire.

f. 408. Found 30 Yards deep at Arkendale, in the same Stratum with f. 402. supra.

f. 408*. Found among many others, in a Stratum of flatey Stone, at the Brow of a vast Precipice, on the top of Windedg, a very high Hill in Arkendale, Yorkshire. This part, where these are found, is perhaps the highest Ground in England, and the most raised above the Surface of the Sea. It lies near the mid-way between the East and West Sea: and some few Miles distant, in another Ridge of Hills, about the same Height with this, there arise Streams that pass into those two opposite Seas.


f. 410. Mr. Southwell, King's-Weston, Gloucestershire.

f. 411. Dudley, Staffordshire.


f. 412. Minster, in the Peak.

f. 413. Lead-Mine near Worksworth in the Peak. Figur'd by Dr. Lister, de Conchitis, Plate 464, n. 25.

f. 413*. A Shell of the same Species, and in like Stone, from the Isle of Anglesey. Dr. Evans, Lord Bishop of Bangor.

f. 414. From Colonel Byerly’s Lead-Mines, 2 Miles from Richmond, in Yorkshire.

f. 415. [Dissolved, and perished.]


CLASSIS III. PARIS III.
Bivalvia non Aurita, Testis paribus.

SECTIO I.

Ad Cardinem commissuram Dentibus multis minutis donata, seu Leptopolysinglyymi.

ARTICULUS I.

Figura subrotunda.

[A] f. 418, 419. Given me by Mr. Jackson, vid. c. 29. supra. This Species of Shell-fish, is pretty commonly found upon our own Shores. One of these still retains the natural Colour, and both of them are very perfect and fair. All to f. 425 inclusive, seem to be of the same Species.

f. 420, 421, 422. Harwich-Cliff.

f. 423. Found in a Gravel-pit, on the North side of Shooters’ Hill, Kent.

f. 424, 425. Found in sinking a Well, at Brompton, Kent.

ARTICULUS II.

Figura oblonga.


f. 427. Barrington, Gloucestershire.


f. 429. Aulesworth, Gloucestershire. This and the two following seem to be the same Species which is figured by Dr. Lister, among the Muscles, N° 207. of his Hist. Conchyl. and which is at this day found in the Seas of Jamaica. There is also an English Shell amongst the Pett. Polypleysinglyymi, N° 69. not much unlike it.

f. 430, 431. Mr. Jackson, vid. c. 29. supra.

f. 431*. Petichunculus exigus albus admodum tenuiter striatus. Lst. Hist. Conchyl. L. 3. N° 69. 'Tis found in the Western Coasts of Dorsetshire, Devonshire, &c. This was taken out of the Stone of a Quarry near Sherborn, Gloucestershire.

f. 431-
Four small Cuneiformes, and a Stone form’d in a Shell of the same sort, from Clipston Quarry, Northamptonshire.

Four, found in a blue Clay in digging the Canal at the Earl of Montague’s-House at Boughton, Northamptonshire.

Another, of the same sort, dug up in a Tile-Clay-pit in Turnham Parish, 3 Miles from Maidstone, Kent.

A Stone form’d between the 2 Shells of a Bivalve, which seems reducible to this kind. Found in the Quarries about Quainston, in Buckinghamshire. Mr. Stonestreet.

**Secio II.**

Bivalvia testis paribus, paucis Dentibus majoribus ad Cardines donata.

**Articulus I.**

Figura subrotunda, seu Pectunculi.

**Divisio I.**

Leves.

Richmond Clay-pit. This is the *Pectunculus Maximus* subfuscus valde gravis of Dr. Lister in his Hist. Conv. N° 108. In his Hist. Animal. Anglia, he calls this Concha, è maximis, admodum crajfa, rotunda, è nigro rusescens. Conf. N° p. 79, infra. Aldrovandus found one of this Species in a Mountain near Bononia, in Italy, Musæum, p. 465.

Another. *Ibid.* Lodg’d in a large Mass of the Ludus Helmontij. ’Tis evident from this, that these Ludi are Nodules: and were form’d before the Subidence at the Deluge. The whole of this is accommodated to the Shell: and a Crust of the yellow Matter of that sort that the Partitions of this Body are compos’d of, immediately surrounds and invests the Shell on all sides. The Shell is fill’d with a Pyrites, vid. f. 681. *infra,* that also being of this sort, and thick set with Fragments of Shells in all parts.

Another, *ibid.*

Another with a Pyrites concreted upon it. *Ibid.*

Another, *ibid.*

Another, *ibid.*

Another less, *ibid.*

The Shell of this being struck off, shews a Pyrites molded in it.

Another still less, *ibid.*

Another less yet, *ibid.*

This is so small, as not much to exceed a large Pea in bigness. There are great numbers of this Size, as also of Pyrites of the same Size, and form’d in such Shells, found in this Clay-pit.

Two Pyrite, of the same Size and Shape with...
the precedent, and seeming to be form'd in the Shells. These from the Cliffs of Sheppey Island.

f. 442. A Stone form'd in a Pectunculus somewhat more convex than that f. 433, otherwise little different from it. The Shell it self being perished and gone, is succeeded by a Sparry Crust. When it so fell out that Shells were lodged in Stone that was lax and porous, so as to give Passage to Water, that, pervading the Stone and carrying with it Salts, Particles of Spar, or other Minerals, whose constituent parts are scabrous or angulated, by little and little frets, wears and carries off the parts of the Shell. And in tract of time, the Water continuing still to pass, deposits, in the room of the Shell, Particles of such sparry or other mineral Matter as it happens to bear along with it, successively, till it has fill'd the Cavity. Now the Matter being thus collected and cast in the Place which the Shell took up, it must in course assume the very shape of that Shell. Which seems to be the whole of this Affair, that has much amused some People who have not thoroughly consider'd these things. This was taken out of a Stratum of Stone on Gaxington-Hill, Oxfordshire.

f. 442. Another Stone, formed in a Shell of the same Species with the precedent. Out of a Quarry near Quainton in Buckinghamshire.

f. 443. Found on the plough'd Lands on a Hill near Wheatland's Mill, beyond Northbleach, Gloucestershire. This is one sort of the Bucardites.

f. 444. Another of the Bucardites. Badminton, Gloucestershire.

f. 445. Another, less, Stow on the Wolds, Gloucestershire.

f. 446. [Dissovd, and perislicd.]

f. 447. Harwich Cliff.

f. 448. Another, of the same Species, in Stone; with Stone also moulded in it. From the same Cliff.

f. 449. Stone moulded in another of the same Species. From Southampton.

f. 449. A Pyrites moulded in another of the same Species. Sheppey-Island, Kent.

f. 450. Another Shell little different from f. 447. There is a Shell from the West-Indies, very like this, yet not the same. This was found in the great Sand-pit near Woolwich: There are vast numbers of them, lying amongst other Species, in Strata 10 or 12 Foot deep, for near 1 4 of a Mile together. They are found among a great variety of other Shells, also in all the Sand-pits up-on Black-Heath: in the Stone by the Road, betwixt Stifford and South Okendon: as also at Orsett, which lies about three Miles East of it.


f. 452. Another, from the Sand-pit upon Shooter's-hill.

f. 453. A Pair, somewhat less, out of a Stratum of Stone near Stifford, Essex.

f. 453. Two single Shells, of the same Species, and out of the same Stone with the foregoing.
Another, Sherborn, Gloucestershire.

Another, Windrush, Gloucestershire.

Another, Mr. Jackson. Conf. c. 29. supra.

From the great Chalk-pit near North-street, Kent.

Found near Pickering, Yorkshire.

On the ploughed Lands, on the North-side of Sir Ralph Dutton's new Park, at Sherborn, Gloucestershire.

Found near Pickering, Yorkshire. There were more of the same.

Sherborn, Gloucestershire.

Farmington, Gloucestershire.

On a Hill, near Wheatland's Mill, beyond Norleach, Gloucestershire.

Out of the great Quarry, at Barrington, Gloucestershire.

Found in the Fields near Turk-Dean, Gloucestershire.

Portland Quarry.

Aylesworth, Gloucestershire.

Widdrington-Fields, Gloucestershire.

Cowley, near Oxford.

Marston, Northamptonshire. Dr. Evans, Lord Bishop of Bangor, sent me one of the same Species, found in the Isle of Anglesey.

Widdrington, near Randcomb, Gloucestershire.

Sherborn, Gloucestershire.

Found on the side of a pretty high Hill, two Miles West of Stokesley, Yorkshire. Vid. f. 536.

From Sir Ralph Dutton's Home-Quarry, Sherborn, Gloucestershire.

A small one; from Sir Ralph Dutton's Home-Park, Sherborn.

Cliffs of Sheprey-Island.

This Species of Shell is found in the Seas about Jamaica, and the adjacent Parts; and is called by Dr. Lister, Hist. Conchy. No 138. Peilunculus albus admodum crassus sine fovea sulco conspicuous. These were given me by Mr. Jackson. Conf. c. 29. supra.

This is an English Shell, [A] but fretted and worn. 'Tis called by Dr. Lister, in his Hist. Conch. Peilunculus omnium crassifimus, Fasciis ex latere bullatis donatus, No 122. Given me by Mr. Jackson. Conf. c. 29. supra.

Barrington, Gloucestershire.

In a Quarry near Halsden, Northamptonshire.

Four. Richmond Clay-pit, Surrey. The Shell of one of these is perforated with a small round Hole, as if bored by the Tongue of the Purpura. See my Answer to Camera. p. --

X 4
f. 487. Two Pyritae, moulded in Shells of this Species; and found in the same Place.

f. 488. Sherborn, Gloucestershire.

f. 489. Ibid.

f. 489*. Found in Harwich-Cliff. The Fascia in this are very small and fine.

f. 490. Windrush, Gloucestershire.


f. 492. Northleach, Gloucestershire.

f. 493, 494. Sherborn, Gloucestershire.

f. 495, 496. Sherborn, Gloucestershire.

f. 497. Oxendon, Northamptonshire.

**DIVISIO III.**

Petunculi. Fig. subrotunda, striati à Cardine ad Marginem.

f. 498. Richmond Clay-Pit, Surrey.

f. 499. Stifford, Essex.

f. 500. Ibid. This lies upon a Shell of the same sort with f. 453.

f. 501, 502. Ibid.

f. 503, 504. Barrington, Gloucestershire.

f. 505, 506. Pyritae. Sheppey. [Dissolved and perished.]

**DIVISIO IV.**

Petunculi. Fig. subrotunda à Cardine ad Marginem sulcatis.

f. 507. [A] This, and the following, to 519*. were given me by Mr. Jackson. Conf. c. 29. supra.


f. 514. This [A] and the following, to f. 519. inclusive, are now found upon the Coasts of England; and perhaps the seven foregoing may be of the same sort. These six are nearly of the same Size and Growth.

f. 515. f. 516. f. 517. f. 518. f. 519.

f. 519*. A Piece of a large Cockle; but so broken, as to appear like an entire small one.

f. 520. A small one, from the Quarry near Sherborn, Gloucestershire.

f. 521. A Piece of a large Cockle; found in a Chalk-pit near Rygate. This is the Petunculus crassus, maculatus siriis imbricatis conspicuis. Lift. Hift. Conchyl. No 160. which is at this time found on the Coasts of the Leeward-Islands and Jamaica.

f. 522. An Impression, found in sinking a Well near Marybone, Middlesex.

f. 523. Harwich-Cliff.

f. 524, 525. Ibid.

f. 526, 527. [A] These two lay a Foot deep in the Sand, two Miles from the Sea, in the Marshes near Croft, Lincolnshire.

Mr.
Mr. Morton. This is our common Cockle. **Lift. Hist. Cowbryl.**

N° 171.

f. 528. Another of the same; [A] found with several more 30 foot deep, in digging to make a Sluice near Boston, Lincolnshire. They lay in a Bed of blue Clay. Mr. Morton.

f. 529. Another [A], in Stone; from the Cliffs, between Skegness and Ingoldsmells, Lincolnshire.


f. 531. [A] An Impression of a Cockle of the same sort found with f. 424. at Brompton, in Kent, by Mr. Emmet, in sinking a Well. There happening to have been a lesser Cockle in the larger, the Stone exhibits an Impression of this also.

**Divisiοn V.**

*Peclunculi Figura subrotunda diversis modo striati.*

f. 532. The several Striae of this are disposed in such manner, as to form acute Angles on the middle of the Back of the Body, all parting towards the Margin of it. Westhall, near Burford, Oxfordshire.

f. 532*. An Impression, made by a Pair of Bivalves of the same Species with the foregoing. The Shells were opened, and expanded when the Impression was made. Woodston, Huntingdonshire.

**Articulus II.**

*Peclunculi Figura oblonga; quippe à cardine ad Marginem oppositum proterat.*

**Division I.**

*Sulcis sriis, à Cardine ad Marginem ductis.*

f. 533. Weymouth. Found in a Corn-Field, about a Mile and half from the Sea.

f. 534. Out of a Stone-pit near the River Medway, betwixt Maidstone and Rochester, Kent.

f. 535. Out of the same Stone-pit.

f. 536. Found on the side of a Hill near Stokesley, Yorkshire, with f. 472.

f. 537. Broad-Rislington Fields, Gloucestershire.


f. 539. Stawell, Gloucestershire.

f. 540. Yanworth, Gloucestershire.

**Division II.**

*Sulcis stintis, diversis modo ductis, ex altera siliicet parte fasciatim dispositis, ex altera vero à Cardine ad Marginem procurentibus.*

f. 540*. A Pair, very fair and entire, beat out of a Bed of Clay in a Cliff betwixt Weymouth and Rodipole, on the East-Side of a Gulph on the Shore there.
From the fame Place; where No. 608. infra, are also found.

A Shell, of the fame Species with the foregoing. Found near Aldsworth, Gloucestershire.

Another, of the fame Species, but much less. Found in a Quarry at Hampnet, Gloucestershire.

Another. From Northamptonshire. Mr. Morton,

ARTICULUS III.

Petunculi forma sere triquetra, laves.

Tewkesbury, Gloucestershire.

From Tewkesbury. Found on the top of a high Hill.

Werkton Stone-pit, near the Mill, Northamptonshire.

Sherborn North-Fields, Gloucestershire.

Stowell, Gloucestershire.

Hampnet, Gloucestershire.

ARTICULUS IV.

Bivalvis paribus testis, paucis ad Cardinem Dentibus Figura a Latere ad Latus oblonga.

DIVISIO I.

Altero Latere profento, altero brevi, seu Cunei.

Sect. I.

Superficie sulcata, à Card. ad Marg.

Found on the plough'd Lands, on the side of a Hill, near the Road from Sherborn to Burton on the Water, Gloucestershire. There were great Numbers of these in this Place. I observed of the fame sort, and some of almost double this Size, in the Road near Wansford, Northamptonshire.

Two less, found along with f. 550, 551.

Hedington, Oxonshire.

Stow on the Wolds, Gloucestershire.

Colmogers, Gloucestershire.

Farmington, Gloucestershire.

Cheltenham, Gloucestershire.

A Stone, form'd in a Cuneus, with part of the Stone in which it was lodged. From Abdon, Gloucestershire.

Found near the Oxford Road to Gloucester, about 5 Miles from Gloucester.

Northleach, Gloucestershire.

Sherborn, Gloucestershire.

Hedington, Oxonshire.

A Pair, small, very finely striated. Found in a Sand-Pit on the side of Shooter's-Hill, Kent.
Sec. II.
Cunei superficie lavo.

The Shells of several of the Bodies ranged in this Class, are perished and gone; and only the Stones formed in them remain. These were formed by the insides of the Shells, which sometimes are smooth, when the outsides are sculpted; so that no certain judgment can be made, without the Shells in which they were form'd, whether these be class'd rightly or not.

f. 564. Windrush, Gloucestershire.

f. 565. Found near Great-Funtley, Hampshire.

f. 566. From Cumberland.

f. 567, 568, 569, 570, 571. [A] Whitby Allum-Mines, along with the Ammonite, A. 51. These are very like one sort of our River-Mussels.

f. 572, 573, 574, 575, 576, 577, 578. [A] Found in several places in the plough'd Fields about Sherborn, Gloucestershire. These have no Remains of the Shells on them, but seem to be form'd in Shells of the same sort with the foregoing from Whitby. There are of this Species found on Yenfon-Hill, in Hinckbridge Parish, about 3 Miles from Milburn, Somersetshire.

f. 579. Minster-Lovel, Oxfordshire.

f. 580. Risington-Parva, Gloucestershire.

f. 581. Found in the Road near Pickering, Yorkshire. There's an Impression of a Pecken on Stone adhering to it.

f. 582. Found in the same Road, near the former.

f. 583. Found loose on the side of a pretty high Hill, 2 Miles West of Stokeley, Yorkshire. There are Sparks of a Mica in it.

f. 584, 585. Two, small, of a Pearl-Colour. Stafford, Essex.

f. 585. A Pyrites, form'd in a Cuneus, seeming to be of the same Species with that, f. 570, but much less, being probably form'd in the Shell of an Animal that was very young. Found, 60 Foot deep, in the great Clay-pit, Richmond, Surrey.

f. 586, 587, 588. Three Pairs. From the great Sand-pit on the East-Side of Woolwich. There are vast, and almost incredible Numbers of them here, as also of Oyster-Shells, and some other Bivalves, lying in a Stratum of Loam that is about 10 Foot thick, and is immediately under the Turf. Indeed there are such Multitudes of the Shells, especially of this Species, that in most parts of the Stratum they lie as thick and close as they possibly can, in Layers that are horizontal, parallel to each other, and to the great Stratum of Sand, that lies immediately underneath this Stratum of Loam and Shells. The whole has apparently the Face of a Sediment; and carries evident Marks of its having thus settled down out of a Fluid. There are of the same sorts of Shells lying in like manner in a Stratum of Loam, above a vast Stratum of Sand of vast extent. At the East End of Woolwich, and in all parts of Black-Heath, Kent and Essex.
f. 589, 590, 591. Stones form'd in the same Shells, with part of the Shell still adhering. From the great Sand-pit at the East-End of Woolwich.

f. 591 x. Another, from the same Place. This is manifestly bended.

f. 592. Found in the River Coln, at Compton in the Hole, four Miles from Randcomb, Gloucestershire.

f. 593. Found at Moreland, on the River Side, Westmorland.

f. 594. Brought, upon plough'd Lands. [A] This, and the two following, seem to be the English Shell describ'd by Dr. Lister, in his Hist. Conch. N° 247. under this Name, Tellina fasciata, ex rubro variegata. This (f. 594.) seems to be the same with the Chamalites oblongus Aldrov. Mus. L. 4. p. 836. N° 5.

f. 595. Near Scarborough Spaw, Yorkshire.

f. 596. Found on the Shore of Scarborough, Yorkshire.

f. 597. Found in a Brook, near Lubenham, Leicestershire.

f. 598, 599, 600. From Whitton-Cliffs, Lincolnshire. In these the Shell is gone, and succeeded by a sparry Cruft of like Figure and Dimensions. That of Aldrov. Mus. p. 837. N° 2. seems to be of this fort. He calls it, Chamites fasciatus.

f. 601, 602, 603, 604, 605. Ibid.


S E C T. III.

Cunei superficie fasciata.

f. 606, 607. From -- -- --- in Northamptonshire. There are likewise of these found along with f. 608. infra.

f. 608. Three Pair, and a single Shell, very fair, and intire, with Studs set in a fasciated Order; i.e. in Rings incircling the Cardo. Found on the Shore of the East-Side of a small Gulph between Weymouth and Rodipole, being wash'd out of a Bed of Clay in the adjacent Cliff.

f. 608 x. This is of the same Species; but the Shell is perished, and succeeded by a sparry Cruft of like Figure and Dimensions. Found near Bampton, Oxfordshire.

f. 608 a. This shews the Form of the Stone moulded in this kind of Shell. The Pores of the Shell appear to be saturated with Spar. Found with the foregoing.

f. 608 b. Part of a Valve of one of the same Shells, from the same Place; having in the Infide of it two other Shells, of different kinds affix'd. By which it appears that the Fisht had been for some time before dead, and gone.

f. 608 c. Part of another. This, and the former, serve to shew the Form and Constitution of the Cardo of this kind of Shell.
f. 609, 610. Two Stones seeming to be form'd in Shells of the same Species which those f. 608. From a Quarry a quarter of a Mile North-West of Morton, Lincolnshire. These are call'd Hippephaloides by Dr. Plot, Nat. Hist. Oxfordshire.

f. 611. Another Stone, of a Shape not so oblong as the preceding, Portland-Quarry. Of several Hundreds that I have seen of this sort, from this Quarry, this is by much the fairest. "Tis indeed perfect and entire; and has upon it all the Lineaments of the Inside of the Shell express'd upon it with wonderful exactness.

f. 612. Portland Quarry.

f. 613. Another of the same kind, found on the top of an Hill on the West side of Bath.

f. 614. Found in the Parsonage Garden at Southrey, Norfolk.

f. 615. to 618 inclusive, being fill'd with the Matter of the common Pyrites, are dissolved and perish'd.

f. 619. In the great Quarry at Barrington, Gloucestershire.

f. 620, 621. Ibid.

f. 622. Stroud, Gloucestershire.

f. 623. Sherborn, Gloucestershire.

f. 624. Ibid.

f. 625. Farmington, Gloucestershire.

f. 626. Hampnet, Gloucestershire.

f. 627. Sherborn, Gloucestershire.

DIVISION II.

Quarum utrumque Latus à Cardine in longum protenditur, seu TELLINÆ.

[A] f. 628, 629, 630, 631, 632, 633, 634. Found in several Places in the plough'd Lands about Sherborn, Gloucestershire, where they are very plentiful. The same Species are found in great numbers in a Stone-pit near Moreton, Lincolnshire. These are only Sand-stone, cast in a Shell which very much resembles one of our River Muscles, which Dr. Lister calls the Musculus angulus citrinus, No 3. Hist. Conchyl.

f. 635. One adhering to a Mass of Stone, the exterior Shell is worn off, but the interior being fenced with Stone, is still preserv'd.

Cirencester, Gloucestershire.


f. 637. Stawell, Gloucestershire.

f. 638, 639. Sherborn, Gloucestershire.

f. 640. Burford, Oxfordshire.

f. 641. Sherborn, Gloucestershire.

f. 642. Hampnet, Gloucestershire.

f. 643. Northleach, Gloucestershire.

f. 644. Windrush, Gloucestershire.

f. 645. Stiford, Essex.

f. 646. Ibid.

f. 648. Five from the Cliffs of Shoppey Island, Kent.

f. 649, 650, 651, 652. From the Cliffs by the Side of the Humber near Whitton, in Lincolnshire. These are nearly allied, if not of the same Species with f. 603, supra.

f. 653. Tangley, Oxfordshire.

CLASSIS III. PARTIS III.

SECTIO III.

Bivalvia Testis paribus ad Cardinum commissuram non dentata.

ARTICULUS I.

Figura oblonga à Cardine ad imum Marginem, sive Musculi.

f. 654. Large Muscles found in the Banks of the River Welland, near little Bowden, Northamptonshire.

f. 655. Iflip, Oxfordshire.

f. 656. Barrington, Gloucestershire.

f. 657. Burford, Oxfordshire.

f. 658. From a Stone-pit near the Mill at Werkton, Northamptonshire.

f. 659. Fullbrook, Oxfordshire.

f. 660, 661, 662, 663, 664. Found in the great Quarry at Barrington, Gloucestershire. They are blunter at the Cardines than ours, and seem to be a sort of West-Indian Muscles. They are found in great numbers and lying very thick, which indeed appears from the following Mafs.

f. 665. Four of the same in a Mafs of Stone from the same Place.


f. 668. The Valves of this are distanced by Infusion of more stoney Matter than the Shells could contain. Fullbrook, Oxfordshire.

f. 669. A short thick Muscle. This seems to be another sort of West-Indian Muscle. Stroud, Gloucestershire.

[A] f. 670. This is a young Shell of our common English Sea-Muscle. Tangley, Oxfordshire.

[A] f. 671. Another still less of the same, younger, and less. Windrush, Gloucestershire.

f. 672. A small one, of the same kind with f. 660, from Northamptonshire. Mr. Morton.

f. 672*. Three small Muscles seeming to be of that Species that Dr. Linfer calls Pholas Niger, India occidentalis. Hift. Conchyl. L. 3. No 268. These were found near Foxcot, Oxfordshire.

f. 673. A long slender Muscle, from the Cliffs at Whitton, Lincolnshire. This is the Virginia Muscles. There was one of this Species in Mr. Banister's Drawings.

f. 674. Found on the plough'd Lands, on a Hill near Wheatlands-Mill, beyond Northleach, Gloucestershire.

f. 675
f. 675. Hampnet Fields, Gloucestershire.

f. 675*. Mytylus Pinniformis. Out of the great Quarry at Barrington, Gloucestershire.

Sectio IV.

Bivalvia Testis imparibus aliquo Parte semper biantibus.

Articulus I.

Ficura longa, angusta, ejusdem ubic latitudinis, seu Solenes.


Articulus II.

Ficura oblonga Telliniformi, seu Chama.


Articulus III.

Ficura oblonga a Cardine ad imum Marginem qua Parte biant, seu Pinna.

f. 680. A Stone formed in a Pinna. From the great Quarry at Barrington, Gloucestershire.

f. 681. Part of a Pinna of a Pearl Colour, adhering to a Piece of the Ludus Helmontij. Clay-pit near Richmond Wells, Surrey. There are Fragments of other Shells that every where discover themselves in breaking the Stone. vid. f. 434. supra.

f. 682, 683. Ibid.

f. 684. Taken out of the 3d Stratum of a Quarry on the top of a pretty high Hill near Thornton, by Pickering in Yorkshire.

f. 685. Burford, Oxfordshire.

f. 686. Out of a Stone-pit near Irchefter, Northamptonsire. Mr. Morton sent me this: and has since described this in his Nat. Hist. of Northamptonsire. p. 197. Tab. 3. Fig. 12.

Classis IV.

Multivalvula.

Sectio I.

Ex tribus testis constantia.

Articulus I.

Fic. ad Chamas accedente cum Testa tertia parva, valvis juxta Cardinem opposita, seu Pholades.

g. 1. [A] Pholas latus rugosus ex dimidio dorso & asper. Lif. Hist. Conchyl. N° 279. This was found in Harwich Cliff. The same Species of Shell-fish is at this day found living at Sea, on the Northern Coasts of England.

g. 2.
Another, of the same Species, but bigger: Chalk-pit, Lullingston Park, Kent.

CLASSIS V.
ECHINI.

See the Catalogue of the exotic Fossils, where this Distribution of the Echini is somewhat enlarged; by an Addition of a 2d Division to Art. II. of Sect. II. of the Spatagi, and a whole Genus under the Name of Pentaphylloides.

PARS I.

Duobus in Testa foraminibus, tuberculis exiguis & fere equalibus in superficie donati, seu SPATAGI.

SECTIO I.

Spatagi qui in uno latere fulcum insignem habent, Cordate aliquibus dicti.

ARTICULUS I.

Foraminibus versus Latera positis,uno sub fissura, altero in Latere opposito.

DIVISIO I.

Figura parum acuminata.

b. 1. From the great Chalk-pit near Greenhithe, Kent. It lay near 60 Foot deep.

b. 2. Chalk-pit, Purfleet, Essex.

b. 3. Chalk-pit, Northfleet, Kent.

b. 4. Chalk-pit near Graveshend, Kent.

b. 5. Chalk-pit, by Greenwich.

b. 6. Chalk-pit, near Deptford.

b. 6 x. This has on it a small Pecket, the Shell of a long slender Vermicula marinus, and the Bases of several Balani. Charlton, Kent.

b. 7. A yellowish Flint moulded in a Shell of this Species. Gravel-pit near Islington.

b. 8. Another. Found in a Gravel-pit near Mitcham, Surrey, by Charles Dubois. The upper part of this has a Cavity in it with 5 Sinus's, so that the flinty Matter appears not to have reach'd to the top of the Shell [which in this Species is raised pretty high] wherein 'twas form'd, or to have taken an Impression of it, as those which are form'd in empty Shells have. This happen'd probably from the interposition of the Body of the Fish, not permitting the flinty Matter, entering, to approach that part of the Shell to which the Fish was annex'd. So that this Flint fell short of filling the Cavity of the Shell by all that Space which the Body of the Fish possessed; and therefore as the Basis or
Or lower part of the Stone has on it the Impression of the Shell, and exhibits the Form of it; the upper exhibits the Form of the contiguous Parts of the Fish.

**DIVISIO II.**

*Figura Compressiire.*

- h. 9. Greenwich, Kent.
- h. 10. Charlton, Kent.
- h. 11. Dartford, Kent.
- h. 12. Croydon, Surrey.
- h. 13. Rygate, Surrey.
- h. 15. Deptford, Kent.
- h. 16. Purfleet, Essex.
- h. 17. Gravesend, Kent.
- h. 18. Northfleet, Kent.
- h. 19. Deptford.
- h. 20. Ibid.
- h. 21. Ibid.
- h. 22. Purfleet, Essex.
- h. 23. Greenwich, Kent.
- h. 23 x. Northfleet, Kent. This is the smallest I ever remember to have seen.
- h. 24. This hath parts of the Shells of the common Vermiculus marin., the Vermiculus Nautiloides [A] of Dr. Lister Hist. Conch. No. 5. a reticulated Film, found sometimes upon Sea-Shells, and usually supposed to be the Remains of the Vesicles of the Spat of some sort of Shell-fish; besides these, there are some Coralline Efflorescencies upon it. Netleybed, Oxfordshire.
- h. 25. This hath parts of the Shell of a sort of Oyster sticking to it in several places. From —— in Hertfordshire.
- h. 26. This hath part of one of those Shells, pretty big, upon it. Croydon, Surrey.
- h. 27. Purfleet, Essex. This hath several of the Vermiculi Nautiloides of Dr. Lister Hist. Conchyl. sticking to it. vid. h. 24. supra.
- h. 27 x. Gravesend. This is compress'd, so as to part the Plates, and burst open several of the Sutures. vid. h. 40. infra.
- h. 28. A Shell cut in two, to shew the inside of it. There adhere to the outside, Spat, and the Vermiculi Nautil. vid. h. 24. Northfleet, Kent.
- h. 29. Chalk cast in the Shell of an Echinus, and shewing the Lineaments of the Shell very finely. Fetcham, near Leatherhead, Surrey.
- h. 30. A Shell, from Northfleet, broken, shewing the Flint wherewith 'tis quite fill'd, in such sort as to demonstrate 'twas as fine and thin as melted Metal, and is run in the Shell as in a Mould.
- h. 31. Another immers'd in a black Flint: and broken so as to shew its Cavity fill'd with Flint. Croydon, Surrey.
b. 32. Another also fill'd with Flint, and having Flint adhering externally to it. This Shell is much compresst, broken, and its parts displac'd. Charlton, Kent.

b. 33. An Echinites, form'd in the Shell of an Echinus Spatagus, of the Sort, and much of the Size of that b. 15. supra. very fair and perfect, having taken off all, even the finest Lineaments, of the Shell wherein it was cast and moulded. The Flint within appears to have been contained thorough one of the natural Apertures of the Shell, in such quantity as to have environ'd the Shell, and taken an Impression of the outside of it, with not lefs exactness. Betwixt the exterior and interior Flint is a Space, or Interval, equal to that of the Shell, that made these Impressions, which Shell in tract of time perish'd, and is now quite disappare'd. Lullingston-Park, near Ainsford, Kent.

b. 34. A Stone form'd in the Shell of an Echinus Spatagus, and inclofed in a flinty Peble. The Shell seems not to have been entire; but where it was, there appears a Vacancy between the Echinite and Flint, answering to the dimensions of the Shell. Found in a Gravel-pit near Gravesend.

b. 35. A Piece of the same flinty Peble, having on it the Impression of part of the outside of the Shell.

b. 36. Another Echinite adhering to a grey Flint, near Henly, 4 Miles from Ipswich, Suffolk.

b. 37. Another adhering to a black Flint. Oak of Honour Hill, beyond Peckham, Surrey.

b. 38. Another, found upon Banstead Downs, Surrey. There appears in this too an Interstice, between the Echinities and the Flint, of the thickness of the Shell.

b. 39. An Impression of part of the outside of this Species of Echinus upon a greenish Flint. Richmond-Park, Surrey.

b. 40. An Echinite or Flint, form'd in an Echinus compresst'd, crack'd and opening at the Sutures in several Places, found among the Gravel in the Street, near Wadham Colledge, Oxford. The Shell in which this was form'd, was in much the same Condition with that b. 27x.

b. 40x. Another also compresst'd. Found on the Downs near North Tudworth, Wiltshire.

b. 41. Another of a brown flinty Peble, the Impression and Lineaments of the Shell appearing plain and distinct, and even the very Sutures of the Shell. Out of the great Gravel-pit on the East side of Hyde-Park.

b. 42. Another of a yellowish brown Flint. Harrow on the Hill, Middlesex.

b. 42x. Another, of a grey Flint. Found in a Gravel-pit near Greenwich.

b. 43. Another of a dusky yellow Flint, very perfect and fair. Near Stilton-Wellis.

b. 43x. Another. Hitchin, Hertfordshire.

b. 44. Another, Enford, Wiltshire.
Another. Kensington Gravel-pits.

Another. Barkhamstead.

Another of a black Flint, very perfect and fair. Boxhill, in Surrey.

Another of a light grey Flint. Henly upon Thames.

Another, found in the Fields near Eton Bray, in Bedfordshire.

Another, very small, near Highgate, Middlesex.

Another. Newington, Surrey.

Found on the Downs near North-Tadworth, Wiltshire.

Parts of the Shell of an Echinus Spatagus, with Shoots of Crystal on the inside, set in Rows, parallel to the Sutures of the Shell in a very regular and beautiful manner. Out of a Chalk-pit, on the Downs, near two Miles from Croydon, Surrey.

This is of a Species quite different from any of the precedent; it having the Sulcus at the end shallower: and the five oblong Depressions observable in those, are wanting here, and the Shell smooth at top. Cherry-Hinton Chalk-pit, near Cambridge.

**Articulus II.**

*Spatagi Cordiformes uno foramine in media fere basi, altera in ipsa fissura posito.*

A small yellow one. Witney, Oxfordshire.

Two of a grey Colour. Barrington, Gloucestershire.

Two, yellow, from the Stone-pit upon Cowley-Common, near Oxford.

Found in the Fields near Heddington, by Oxford.

Farmington, Gloucestershire.

Winchcomb, Gloucestershire.

Bifester, Oxfordshire.

Plough'd Lands on the Edge of Clarkendown, near Bath.

Windrush, Gloucestershire.

A large flat Echinites. Found in a Stone-pit between Earnham and Asleby in Lincolnshire. Mr. Morton.

Another, larger, of a brown Colour, not so flat as the preceding. Found in that part of Tanglev Fields which is called Tanglev-bottom, near Burford in Oxfordshire. This is the Brontia or Ombria of Dr. Plot. Nat. Hift. of Oxfordshire, p. 90. Tab. 2: Fig. 9, 10.

Fullbrook-Field, near Burford, Oxfordshire.

Northleach-Field; where they are found plentifully: as also in the adjacent Parts, of Oxfordshire and Gloucestershire, for several Miles round, upon the plough'd Lands. This shews the Form of the inside of the Shell, and the Matter twas fill'd with; amongst which are great numbers of Ova of Fishes.

Witney, Oxfordshire. I found the like at Arlington, near Byberry, Gloucestershire.
Sectio II.

Spatag nullo fulco ad latera donati, utrisq; foraminibus in basi Tesa.

Articulus I.

Altera foramine in ipso Basii Margine, altero versus oppositum marginem sibiis Galeati aliquibus dicti.

I have observed the Echini of this Class of all Sizes, from one Inch \( \frac{1}{2} \) length in the Bafis to three Inches. There is something of a Difference in the Shape of several of these; some being flatter on the top, others more coupled; but the Differences do not seem to be so great as to imply that they are of distinct Species. Some of them are fill'd with Chalk; others with Flint.


h. 63. Purfleet, Essex.

h. 64. Netlebed, Oxfordshire.

h. 65. Chizlehurst, Kent.

h. 66. Croydon, Surrey.

h. 67. North-Tudworth, Wiltshire.

h. 68. Gravesend, Kent.

h. 69. Rygate, Surrey.

h. 70. Greenhithe, Kent.

h. 71. Charlton, Kent.

h. 72. Marlborough Downs.

h. 73. Deptford.

h. 74. From betwixt Southampton and Portsmouth.

h. 75. Greenwich, Kent.

h. 76. A galeated Echinus almost wholly fill'd with a dark grey Flint, found in sinking a Well at Sarret, a Village 5 Miles from Watford in Hertfordshire. It lay 26 Fathom deep in the Chalk, on an Hill. 'Tis compress'd and somewhat broken.

h. 77. Another, which shows the Sutures very distinctly on the Bafis. Greenhithe, Kent.

h. 78. Another having parts of Vermiculi, and some other Shells affix'd to it, and a good number of the Remains of the Spar of some Shell-fish, vid. h. 74. Northfleet, Kent.

h. 79. Another with several bottoms of small Balani on it. Croydon, Surrey.

h. 80. Another with parts of some Bivalve adhering, which are probably a sort of the Ostrea Arborea: and some small Coralline Efflorefcencies. Chizlehurst, Kent.

h. 81. Another with part of a large Bivalve of the same kind, and three Efflorefcencies of Coral. They are round, \( \frac{1}{2} \) of an Inch in Diameter, and the Striae appear plainly in them running from the Circumference to the Center, as in many sorts of Coral. Greenwich, Kent.
b. 82. Another with some Vermiculi and the flat Shell of a small Peçten adhering to it. Croydon, Surrey.

b. 83. A piece of another with several Vermiculi upon it. Ibid.

b. 84. A Shell of this kind, cut in two, to shew the inside. Northfleet, Kent.

b. 85. A piece of a larger with the flat Shell of an Oyster upon it, and some Remains of Spat. Greenhithe, Kent.

b. 86. Another broken to shew the Chalk contain’d in it. Ibid.

b. 87. Another broken, so as to discover it to be quite fill’d with Flint. It has the flat Shell of a small Peçten and the Bottoms of several Balani upon it: as also a Body flat and round, about \( \frac{3}{4} \) of an Inch over, and very beautiful, striated from the Center to the Limbus, like the Porpitæ, and appear to be of like Original. Deptford.

b. 88 x. A Shell of the same Species with the precedent: having a like striated coralloid Body upon it, very fair. Northfleet, Kent.

b. 88. Another fill’d quite full with Flint, so as to run out at both the Foramina: and has besides a pretty big Mafs of Flint concreted on the outside at the top of the Shell. It has Spat, the bottoms of Tree-Oysters and slender ramose coralline Efflorescencies upon it. Deptford.

b. 88 x. A galeated Echinus, of a Species different from all the foregoing, being capped, and in shape somewhat more conic than any of those. Indeed those differ considerably from each other in Shape, as do also the Echinitæ or Flints, b. 92. & seq. that were form’d in like Shells; some being of a compress’d, others of a round Figure, some flat or depress’d, others rais’d. This was taken forth of a Chalk-pit, near Norwich. The Echinitæ, b. 91, so nearly resembles this in Shape, that it probably was form’d in a Shell of this Species.

b. 89. The Impression of part of the Shell of an Echinus of this kind, in which the Sutures appear very plainly; taken out of a Gravel-pit near Greenhithe, Kent.

b. 90. An Echinus, consisting chiefly of a grey Flint, but towards the top of Crystal, finely wrought and cancellated. Given me by Sir G. Wheeler. Twas found upon an Hill, amongst other Flints near Charing in Kent, in the midway betwixt Maidstone and Canterbury.

b. 91. An Echinus, very large, beautiful and perfect, having taken the Impression of all parts of the Shell and even of the Sutures very distinctly. [Conf. N°. b. 88 x. supra.] Found in a Gravel-pit in Hyde-Park.

b. 92. Another less. I found this not far from Marlborough: and observed others of this sort, and about this size, in several of the Downs of Wiltshire.

b. 93. Another. From the Gravel-pits at Greenhithe, Kent.

b. 94. Another. Henley upon Thames.

b. 95. Another. Gravel-pit, near Iflington Wells.

b. 96. Another. Banstead-Downs, Surrey.
Another found in a Gravel-pit, at Bush-Hill, near Enfield, Middlesex.

Another from Box-hill, in Surrey.

Another found in the Fields near Eyton Bray, Bedfordshire.

Another. Eltham, Kent.

Another from Netleybed, Oxfordshire.

Another. Marybone, Middlesex.

Another, near Lee, on the Edge of Black-Heath, Kent.

Another, a Gravel-pit near Chelsea-College.

Another. Hopwell, Derbyshire.

Another, near Lee, on the Edge of Black-Heath, Kent.

Another, a Gravel-pit near Chelsea-College.

Another. Hopwell, Derbyshire.

Another. Ockbrook, Derbyshire.

Some of these are higher, and more copped or acuminated; other lower, and more round. They are of different sizes from near two Inches to 1/2 of an Inch in height. Some of them are fill’d with Chalk, others with Flint.

A pilcated Echinus, taken up, with different Shells of several kinds, Sharks Teeth, and other marine Bodies, in a Stratum of Chalk above 50 Foot deep, near Greenwich, Kent.

Blyde, Surrey.

Northfleet, Kent.

Ibid.

Bygate, Surrey.

Purfleet, Essex.

Netleybed, Oxfordshire.

North Tidworth, Wilts.

Greenwich, Kent.

An Echinus with a reticular Accretion upon it, extremely fair. Whether this be the Spat of some Shell-fish, or an Alga: or a coralloid Body, I cannot tell; but ’tis at this day found also upon the Shells at Sea.

Another, full of Flint, with Flint adhering outwardly to the Hole in the Centre at the Base. It was a very large piece of Flint; but being of no Use, I broke most of it off. Out of the great Chalk-pit, on the edge of Black-Heath near Deptford.

Another, with the flat Shell of a Peccen adhering to it. Northfleet, Kent.

A pilcated Echinus cut in perpendicular, and emptied of the Chalk, to shew the Inside of it. Greenwich, Kent.

Another, cut horizontally. Ibid.

Another. Croydon, Surrey.

Another. Charlton, Kent.
b. 122. Northfleet, Kent. This, and the following, to 133, are not quite so raised and conical as the foregoing.

b. 123. Gravesend, Kent.

b. 124. Ibid. b. 124*. Purfleet, Essex.

b. 125. Ibid.

b. 126. Rygate, Surrey.


b. 128. Northfleet, Kent.

b. 129. Croydon, Surrey.

b. 130. Chizlehurst, Kent.

b. 131. Marlborough Downs, Wilts.

b. 132. Northfleet, Kent.

b. 133. Ibid. broken to show the Flint included.

b. 134. Deptford. This, and the following, to 139, are still lower and rounder, seeming to be of a different species.

b. 135. Croydon, Surrey.

b. 135*. Greenwich, Kent.


b. 137. Deptford.

b. 138. Rygate, Surrey.

b. 139. Gravesend, Kent.

b. 139*. Northfleet, Kent.

b. 140. A large piece of a Shell, partly immersed in a Black Flint, and partly filled with the same. From the great Chalk-pit at Northfleet, Kent.

b. 140*. A Shell of this pileated Kind, somewhat compressed and cracked, filled with black Flint, and having a Mass of the same, adhering at one of the Holes of the Shell to the outside of it in such manner, that the Flint within is contiguous with that without the Shell. Northfleet.

b. 141. Another, immersed in a flinty Pebble. The inside of this Shell is seen. Found near the mineral Wells on Sydenham Common.

b. 142. An Impression of the Basis of an Echinus pileatus, very fair, and distinct in a yellow Flint. Near Deptford.

b. 143. A small Echinute of the same sort with those 122, &c. to 131, having curiously taken off the Lineaments of the inside of the Shell, found lying loose in a Cavity in the middle of a grey flinty Pebble; which Cavity throws also the Lineaments of the outside of the Shell. Found in a Gravel-pit near Gravesend, Kent.

b. 143*. The Shell of a pileated Echinus, of a ferruginous Complexion, with Parts of the Pyrites growing upon it, in five double Lines, upon the five linear Commissures of the Shell, where 'tis perforated with small Holes standing in Rows. There are also other-like linear Accretions of the Pyrites that intersect the former; these probably attending Cracks that happen'd to be in the Shell. There appears an ochreous Matter at the two Holes: but,
by its Weight, the Shell seems to be fill'd with the Pyrites. This very great Curiosity was found in the Chalk-pit by Greenhithe; in which Pit Pyritae of the like Constitution, and this ferruginous Complexion, are commonly found. See that exhibited in the former Part of this Catalogue, No. b. 3.

b. 144. An Echinine, consisting of a white flinty calculous Matter. Found in a Gravel-Pit on Mitcham-Common, Surrey.

b. 145. This has some degree of Diaphaneity, and approaches the Constitution of an Agate. Gravel-pit, near Hampstead Town.

b. 145*. An Echinine of a dark grey Flint; towards the top is an Hollow that appears to be made by the Shell's being press'd in by some external Force. Found on the Downs near North-Tudworth, Wiltshire.

b. 146. Another, of a dark brown Colour. Walthamstow, Essex.

b. 147. Another. Found on the West-side of Mill-d'Hill, near Hendon, Middlesex.

b. 148. Another. Bromley, Kent.

b. 149. Another, of white Flint. Henley upon Thames.

b. 150. Another, of red Flint. Chislehurst, Kent.

b. 151. Another, of a dark brown Flint. Found upon the Hill near the Observatory in Greenwich-Park.


b. 153. Another. This appears not to have fill'd the Shell, but has pretty large Cavities on several parts of it, as if the Fifth, or Parts of it, were interpos'd betwixt the Shell and the Flinty Matter entering of it, whilst in Solution. Barkhamstead, Hertfordshire.

b. 154. Another. On the top of which is a Cavity, with five Sinus's radiating out, at equal distances from it. Possibly the Fith of this Species of Echinus, may have been of a stellar Figure. And if shrivell'd, or forced up into a small compass, being interpos'd at the top of the Shell, the Flint entering it, would have such a Cavity at top, as is observably in this. Canewood, between Hampstead and Highgate.

b. 155. An Echinine of a brown Flint, appearing to be cast in a Shell of the same sort with that b. 122. Stoke-Newington, Middlesex.

b. 156. Another. Richmond, Surrey.

b. 156*. From——— in Sussex.


b. 158. Another. Harrow on the Hill, Middlesex.

b. 159. Another. Lullingstone-Park, near Ainsford, Kent.

b. 160. Another, of a grey Flint, of a rounder Figure than any of the former; and appearing to have been cast in a Shell of the same sort with that b. 134.


b. 162. Another. Found in the Fields near Eyton-Bray, Bedfordshire.

b. 162*. Another. From Great-Bowdon, Leicestershire.
Another, of a dark brown Colour. Enford, Wiltshire.

Another. Hitchin, Hertfordshire.

Another. Banstead-Downs. I found one very like this on plough'd Lands, near Watford, Hertfordshire.

Another, of a whitish Flint. Thorp, Northamptonshire.

Another. Near Fulham, Middlesex.

ARTICULI II. DIVISIO II.

Spatagi Figura magis compressa, seu Dicoideis.

h. 168. A large Echinus, near 2 Inches in Diameter, and 1/2 of an Inch high. On plough'd Lands, near Woodstock, Oxfordshire.

h. 168 x. Another, with the Basis somewhat less. Witney, Oxfordshire.

h. 169. Another, with the Basis still less, it being but an Inch and 3/4 in Diameter; but the convex Part is raised somewhat higher than the Convex of that.

h. 170. Another, of the same Species with the last, but less. Aulfworth, Gloucestershire.

h. 171. Another, still less. Cowley-Common, Oxfordshire.

h. 172. Another, less. Sherborn, Gloucestershire.

h. 173. Another, less. Ibid.

h. 174. Another, less. Over-Slaughter, Gloucestershire.

h. 175. Another, less. Found along with Cornua Ammonis, Concha Anomia, and other Shells, near Silverton, Devonshire.

h. 176. Another, less. Garston, Oxfordshire.

h. 177. Another, less. Hampnet, Gloucestershire.

h. 177 x. An Echinine of Flint, black, with a Coat of yellow. Found near Norwich.

CLASSIS V. PARS II.

Echini uno tantum foramine praditi, Tuberculis majoribus & inaequalibus, seu Ovariij.

h. 178. An Echinus, 2 Inches in Diameter. From the Chalk-pits at Greenhithe. 'Tis full 2 Inches in breadth, and but 1/2 an Inch in height; and consequently is somewhat flatter than the Echinus Ovarius. Found now on the English Coasts. The Tubercula in this are also larger than those of the English Echinus Ovarius.

h. 179. Another, from the Chalk-pit at Deptford. This is not of quite so compress'd a Figure as the former, and so more nearly approaches the Figure of the English Echinus Ovarius.

h. 180. Another, with part of a Bivalve, and a little Spat upon it. Found in the great Chalk-pit at Northfleet.

h. 181. Another. Northfleet. This has a Spike along with it, which is smooth; and in all probability this kind of Spike belongs to this Species of Shells. Conf. h. 210 x. & h. 226. infra.

h. 182. Another, depres'd by some external Force, so as to make a large Sinus on one side. Deptford.
b. 183. Another, full of Flint. Chalk-pit at Northfleet.

b. 183*. Another, full of Flint, and immersed in Flint. From the Chalk-pit at Greenhithe.

b. 184. Another, from the same Place, full of Flint. The Flint too that, while in Solution, filled it, having run over, and so hanging forth a good way beyond the Shell, till broken off. Purfleet, Essex.

b. 185. Another, having several of the Spines actually upon it, with more lying by in the Chalk: besides several others that were shook off in the clearing away the Chalk. From Greenhithe, Kent. b. 186. Another, filled with Chalk, with a Congeries of small long Bodies appearing in the Chalk, at a Hole on the upper Part of the Shell. These Bodies seem to be some of the little Bones found in this Fish, and which are usually called its Teeth, and lie also in this part of the Shell. Croydon, Surrey.

b. 187. Another, filled with Chalk. Ibid. b. 188. Another, empty'd, so as to shew the interior Constitution of the Shell. Ibid.

b. 189. Another, with the Teeth mentioned. b. 186. Greenhithe, Kent.

b. 190. Another. Found near the Surface, in a Quarry near Farmington-Grove, Gloucestershire.

b. 191. Another, found lying amongst Rubble-Stones, under the Turf, near Sherborn, Gloucestershire.

b. 192, 193. Two small ones; the one filled with Flint, the other with Chalk. Greenwich, Kent.

b. 194. Another. From the Chalk-pit at Northfleet. b. 195. Two others, very small. Ibid. b. 196. Another small one, found amongst Rubble, over a Quarry of Stone near Woodstock, Oxfordshire.


b. 198. An Echinus, filled with Stone. This more nearly resembles our common Echinus. Stow on the Wolds, Gloucestershire.

b. 199. Another. Burford, Oxfordshire.

b. 200. A small one; but having the Tubercula larger, for the Size of the Shell, than any of the former. 'Tis filled with Stone, among which appear some of the Teeth. Vid. b. 186. Barmington, Gloucestershire.


b. 203, 204. Two more, of the same Size with the precedent, but worn smooth. Tangle, Oxfordshire.

b. 205. Another less. Ibid.

b. 206. A Piece of a Shell, kept to shew the interior Constitution of it, and how exactly the Flint, cast in this kind, have been moulded by it. Deptford.
b. 207. An Echinus Ovarius, of a Species different from all the precedent, being more raised, and of a Figure more globose: The Plates and Papillae are larger likewise. There are two of the Spines in the Chalk along with it. From Greenhithe-Chalk-Pits, Kent.

b. 207*. Part of another, of the same Species, but somewhat less. Found about 60 Foot deep, in the great Chalk-Pit, Purfleet, Essex.

b. 207*. Part of another, larger. Croydon, Surrey.

b. 208. Seven Plates of the Shells of Echinii, of the same Species with the foregoing, parted at the Sutures, with the Papillae upon 'em, all large. From the Chalk-Pits of Purfleet, Greenhithe, and Northfleet.

b. 209. A Plate and a Shell of the same Species, larger than any of the former. From a Quarry half a Mile North-West of Clipston, Northamptonshire. Mr. Morton.

b. 210. Five Plates, of Shells of still the same Species. From Greenhithe Chalk-Pits.

b. 210*. Three Plates of a Shell of a different Species, very rare.

Greenhithe Chalk-Pits.

b. 211. Part of a Shell of an Echinus, different from all the foregoing. Greenhithe, Kent.

b. 210*. The Shell of an Echinus Ovarius, of the same kind with that b. 181. having several smooth Spikes lying in the Chalk along with it. Greenhithe.

b. 211. Parts of a large Shell, of the same Species with b. 207: broken, and lying in a Mafs of Chalk, along with several Spines that are thick fet with Rows of small Knobs; which probably are the Spines that belong to this Species. Greenhithe, Kent.

b. 212. A large Spike, with several lesser, in Chalk. Purfleet, Essex.

b. 213. Several small smooth Spikes, in Chalk. Charlton, Kent.

b. 214. A Spike of an Echinus, of the same fort with those called Lapides Judaici, swelling from a short Stalk into a large Knob. Found in a Gravel-pit in St. George's-Fields.

b. 215. Several short, crofs, round Spikes, of different Sizes and Figures. From the Chalk-pits of Essex, Kent, and Surrey. There are of these tumid Spikes found, in plenty, near Wooton-Bassett, Wiltshire.


b. 218. Two on a Stone, along with several Bivalves. Sherborn, Gloucestershire.

b. 219. A small, slender, smooth one, on Stone. Windrush, Gloucestershire.

b. 220. A very fair one, large, near 2 Inches and $\frac{1}{2}$ long, thick set with Knobs in Rows; with part of the Chalk wherein 'twas found lodg'd. At the Depth of above 40 Foot, in the great Chalk-pit at Purfleet, Essex.
Another, *ibid.*

b. 222. Another, different. *Gravesend, Kent.*

b. 223. Several, of different Sizes, swelling a little towards the Middle. From the Chalk-pits of *Essex, Kent,* and *Surrey.*

b. 224. Several others, of near the same Thickness for their whole Length. Out of the same Chalk-pits.

b. 225. Others, of different sorts; from the Stone-pits of *Gloucestershire, Oxfordshire,* and *Northamptonshire.*

[b] b. 226. Others smooth and slender, of near the same Thicknesses throughout. These belong to that Species of *Echinus* that is exhibited, *b. 181, & b. 216.* *Deptford.*

b. 227. A small *Echinus,* fill'd with Flint, and part of it immers'd in a Mass of Flint, which was very large; but what remains was struck off from the rest. *Croydon, Surrey.*

b. 228. An *Echinite,* consisting of a brown Flint, cast in the Shell of an *Echinus Ovarius,* of the same sort with *b. 178,* but somewhat less. *Shooter's-Hill, Kent.* By comparing this with *b. 188,* & *b. 206,* 'twill appear how exactly it answers to the Inside of that Species of *Echinus,* in which it appears to have been cast and moulded.

b. 229. Another, of a yellowish Flint, but less. *Peckham, Surrey.*

b. 230. Another, less, immers'd in a yellow Flint. Round the *Echinite* is a Vacancy answerable to the Dimensions of the Shell.

b. 231. Another. *Finchley-Common, Middlesex.*


b. 234. Another. *Cashalton, Surrey.*


b. 236. An *Echinite,* of still the same sort, of a greenish Flint, not above the bigness of a Vetch; found, in breaking a large Flint, inclos'd in the middle of it. *Barkhamstead, Hertfordshire.*

b. 237. A flinty Peble, having on it an Impression of part of the Shell of an *Echinus Ovarius,* with Impressions of eleven tumid *Aculei,* of that sort which pass ordinarily by the name of *Lapis Judaicus,* surrounding the Impression of the Shell, having all their Apices from it, and their Heads towards it, in such manner, that the *Aculei* seem to have belong'd to, and been affix'd on to the Shell that made the Impression in the midst of them. Found in a Gravel-pit near *Copenhagen-House,* besides *Islington, Middlesex.*

b. 238. A fair Impression, of part of a Shell of a very large *Echinus Ovarius,* on an Agate; found in Mr. Heart's Park at *Lullingston,* near *Ainsford* in *Kent.*

b. 239. An Impression of part of a Shell of an *Echinus* of that sort, *b. 207.* on a grey Flint. A little beyond *Highgate, Middlesex.*

b. 240. Another; from ---- in *Huntingtonsire.* Mr. Morton.


b. 242. An Impression of a single Plate of a Shell of the same Species, taken off with great Exactness. 'Tis on a grey Flint. *Hampstead-Heath.*
b. 243. An Impression of part of a Shell of still the same fort, and of a Spike belonging to that fort too; being of the same with those b. 223. Upon brown Flint. Among Gravel, near Northfleet, Kent.

b. 244. An Impression of a Plate, and Spike, also of the same Species still, on a dark brown Flinty Peble. Hampstead-Heath.


b. 246. An Impression of another leaf, in the middle of a flinty Peble, variegated with yellow, grey, &c. Gravel-pit near Greenhithe.


b. 248. Another, more slender, on a coarse grey Peble. Hampstead-Heath.

b. 249. An Impression of a pretty large Spike of the same fort, on a brown flinty Peble. This Spike appears to have been broken, and inflected, when it made this Impression. Dartford, Kent.

b. 250. An Impression of a thick short Spike, much resembling one of those, b. 215. on a greyish Flint. In Gravel, near Hackney, Middlesex.

b. 251. Another. Downs, not far from Epsom, Surrey.


CLASSIS VI.

Corpora quædam Echinis, ut videtur, affinia.

1. A pentagonal Body; compos'd of two Rows of small Joints. Chalk-pit at Northfleet, Kent.

2. Several Parts and Joints of the same. From the same Place.

3. Part of a like pentagonal Body. In this the exterior Surfaces of the Joints are thick set with small Studs. From the great Chalk-pit, near Croydon, Surrey.

4. Seven Joints, larger than any of the precedent, of another fort of Body. Gravesend, Kent.

5. Several small Joints, of another fort. From the Chalk-pits of Kent, Essex, and Surrey.

6. Several other Joints, swelling in the middle. From the Chalk-pits of Croydon, Purfleet, Deptford, Northfleet, and Greenhithe.

7. Several long Joints, of like Bodies. From the Chalk-pits of Essex, Kent, and Surrey.

8. Several other long Joints, swelling at one end into a Knob, upon which is a pentagonal Figure. Out of the same Chalk-pits.

9. A single one, of the same kind, the Knob of which adheres to a small round Flint. Greenhithe Chalk-pit, Kent.
1.9. A jointed Body, branched irregularly with a Piece of the Chalk in which it was found. Northfleet, Kent.

1.10. Several of these ramose jointed Bodies. From several Chalk-pits in Kent. These broke, shew plainly a Texture like that of the Spikes of the Echini Ovarij, and seem to have serv'd as Appendages, or Trains to some kind of Shell allied to that Echinus. See what is noted of the Entrochi, Class vii. and of the Afteria, Class viii. both which Bodies are also of like interior Texture and Constitution, and break in like manner.

1.11. Several Bodies of different, but regular Figures. From Cowley-Common, near Oxford.

1.12. Part of the Shell of some Body, seeming to be a Piece of some uncommon kind of Echinus, lying in a whitish gritty Stone. From a Stone-pit South-East of Wakerly. There are Fragments of other Shells, and Ova of Fishes in the same Stone.

1.13. An Impression of some Body, seeming to be of the same kind with the foregoing, in a grey Flint. Hampstead-Heath, Middlesex.

CLASSIS VII.
ENTROCHI & TROCHITÆ.

These Bodies are of much the same Texture and Constitution with the Spikes of the Echini Marinij; and have serv'd as Appendages, or Trains, to a Shell not very unlike that of the Echinus Ovarius; but tender and brittle, so that 'tis rarely preserved. Mr. Beaumont has grav'd one Species of it, Philos. Trans. N°--

I have consider'd these Bodies more particularly in one of my Gresham Lectures, Confer. N°i. supra.

K. 1, 2, 3, 4, 5, 6, 6*. Entrochi; found at Stainton, two Miles from Penrith, Cumberland, in a Bank near a Spring, very plentifully. Dr. Nicholson, Lord Bishop of Carlisle.

K. 7, 8, 9. On the Shore of the River near Moreland, and in Westmorland, where such are found pretty plentifully. Bp Nicholson.


K. 13. Many, small, red. Bp Nicholson. Also a Pentagonal of one of the Shells, to which this sort belong. From Howlees, betwixt Newbiggin and Stainton, Cumberland.


K. 14*. From Cumberland. Mr. Clarke.


K. 18. In the same Place. Compress'd and flatted.

K. 19, 20, 21, 22, 23. Five compress'd, from still the same Place.

K. 24, 25, 26, 27. Hollow in the middle, and fill'd with a grey stoney Matter. From the same Place also.

K. 28,
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k. 28, 29, 30, 31, 32, 33. Found in the Bank of a Rivulet at Floweridge, near Shap, Westmorland. They call them there Entrochus. Mr. Clarke.

k. 34, 35, 36, 37, 38, 39. Eight, large, with Vestigia of Branches proceeding forth of them. Mr. Clarke.


k. 42. Many, smaller; from the Banks of the Brook Ellerbeck, near Torpehoe, Cumberland. Mr. Clarke.

k. 43. Many single Joints. Mr. Nicholson, and Mr. Clarke.

k. 44. Many Entrochus, and single Joints. Cumberland. Mr. Clarke.

k. 45. An Entrochus, with a Coralline Body adhering to it, Bp Nicholson. Diocefe of Carlifce.

k. 46. Two, with Spat adhering. Mr. Nicholson. Ibid.

k. 47. An Entrochus, with many Branches arising out of it. Found near Ipswich in Suffolk.

k. 48. Found in the Rubble cast off of a Lead-Mine near Richmond-Moor, Yorkshire.

k. 49. Found, loose, in the bottom of a Quarry by the side of the Road to Fremington, 2 Miles from Mask, Yorkshire.

k. 49*. Found in the Isle of Man; and sent me by Dr. Wilson, Lord Bishop of that Island.

k. 50. Found near Wooly-Hole, by Wells, Somersetshire.

k. 51. Several Entrochus, in Joints; also a Piece of the Shell. From Mendip-Hills, Somersetshire.

k. 52. In the great Lime-pit, near Dudley-Castle, Staffordshire.

k. 53. From a Lead-Mine, near Worksworth, in the Peak, Derbyshire.

k. 54. Three Joints. Haddon Pastures, in the Peak, Derbyshire.

k. 55, 56. Two Trochita. Found in a Heap of Clay in the Pasture of Haddon, in the Peak, near the Earl of Rutland’s House.

k. 57. From several Places on Mendip, Somersetshire.

k. 57*. Entrochus, of various Figures; found in the Rubble and Stone near Charter-House, Mendip; where they occur in great Numbers.

k. 58. A Mass of Stone, with several Entrochus in it, and Fragments of Shells; from a Pit near the Earl of Rutland’s House, in Haddon Pastures, in the Peak.

k. 59. A Mass, very thick set with Entrochus. From the Quarry two Miles from Mask, Yorkshire, mention’d above, k. 49. All the Stone of this Quarry is full of them.

k. 60. Another Mass, as full of them as the former. From a Stone-pit, about 50 Yards in perpendicular, above the River Swale, on the side of a Hill about a Mile from Richmond, Yorkshire. There were great Numbers of these, of Shells, and of Impressions of Shells upon the Stone.

k. 61, 62, 63. Three Masses, with Entrochus, and several Coraloid Bodies. From the great Limestone-Quarry, near Dudley, Staffordshire.
k.64. A Mafs of grey Stone, thick set with Entrochi; from Workworth, in the Peak.

k.65. Mr. Southwell. Found near King's-Weston, in Gloucestershine.

k.66. Ibid.

k.67, 68, 69, 70, 71. Five Masses of Stone, extremely thick set with Entrochi, and having also in them Fragments and Impressions of Shells. Found on the South-side of Ingleborough-Hill, near the Top, Yorkshire. Mr. Groome.


k.73. Mr. Nicholson. Ibid.

k.74. Entrochi, given me by Dr. Evans, Lord Bishop of Bangor. From the Island of Anglesey.

CLASSIS VIII.

ASTERIA.

These have serv'd, as the Entrochi, [Vid. Class 7.] as Appendages to Shells. See one of my Gresham-Lectures, concerning the Origin and Constitution of these Bodies. Confer. No. i. 10. supra.

l. 1. Several Columns of Asteria, and single Joints; from two plough'd Lands ½ of a Mile South from Marston-Trussell, Northamptonshire. One of the Columns has part of the Shell belonging to this Species still adhering to it: and was found by Mr. Howard, Rector of Marston. This last is since described by Mr. Morton, Nat. Hist. of Northamptonshire, p. 239. Tab. 10. Fig. 19.

l. 2. Several Columns, and single Stars, of different Sizes; from the same Place.

l. 3. Others, found plentifully in two Banks near Whilton, Lincolnshire; where the People call them Caffles and Apostles.

l. 4. Others, from Aukborough, Lincolnshire.

l. 5. Others, from Laffington, near Gloucester.

l. 6. A Column, found on the Shore of the River, near Moreland, in Westmorland. Mr. Clarke.

l. 7. Another; found in a Bank, near a Spring, at Stainton near Penrith, Cumberland. Bp Nicholson.

l. 7 x. A Column, somewhat bent, consisting of 18 Stars. From the Shores near Hull, Yorkshire.

l. 8. Several small Stars; found in the Quarries near Sherborn, Gloucestershire.

l. 9. Joints and Columns; from the Cliffs of the River Severn, near Pyton-Passage.

l. 10. Asteria; from Shugborough, Warwickshire.

l. 11. Several Columns; from the Shores of the River near Rugthorp, Yorkshire.

l. 12. A Column, with Fragments of Shells adhering to it; from Lubenham-Brook, Leicestershire.

l. 13.
1.13. Several Columns, Stars, and Wires; from the same Brook.

1.14. Others, found in sinking a Well at Marston-Trussel, Northamptonshire.

1.15. A very strange one, seeming to be the Joint next the Shell. Found in sinking the same Well at Marston. Given me by Mr. Howard, Rector of the Town.

1.16, 17. Two Columns, with Pieces of Shells adhering to them. From a Brook near Marston-Trussel.

1.18. Several, with some of those Branches that are wont to arise from them, called by some, Wires. From the same Brook.

1.19. A pentagonal Column, [an Entrocho-Asteria] jointed, but not sutured, like the common Asteria, betwixt the Angles. Found in a Bank, near a Spring, by Stainton in Cumberland.

1.19 x. Two Columns of the Entrocho-Asteria, with five Sides: and one Column with four Sides. From How-Lees, betwixt Newbiggin and Stainton, Cumberland. Mr. Clarke.


1.21. A Mass of Stone, thick set with Columns, Stars, and Joints of Wires. Found on the Shores of Severn near Arlingham. In some of the Columns, the Manner of the Articulation, or Conjunction of the Stars, is very conspicuous.

1.22. A Mass of Stone, with several Columns in it. Found in the plough'd Lands near Marston, Northamptonshire, along with 1.1. The Manner of the Articulations is likewise observable in this.

1.23. A Mass of Stone, with an Asteria, several Joints of Wires, and Fragments of Shells; from the same Place.

1.24. A Mass of a dark grey Stone, with several Columns in it, vast Numbers of Joints of Wires, and some Fragments of Shells. From the Shores of Severn, near Pyerton-Passage.

1.24 x. Another like Mass, but larger, very thick set with Asteria, both single and in Columns, very fairly display'd; with Fragments of Shells. Pyerton-Passage.

1.25. Another like Mass. The Stars in this are white, glossy, and break much like the Lapis Judaicus, or tumid Spine of an Echinus Marinus. Pyerton-Passage.

CLASSIS IX.

CRUSTACEA.

m. 1, 2. Two small Crabs, not much unlike those which on the Coasts of Sussex, particularly about Shoreham, are called Portugal Crabs. These were found in the Cliffs at Folkeston, near Dover.

m. 3. A Piece of the Claw of a small Crab. From---- in Wales. Mr. Lhwyd.
CLASSIS X.

Piscium Partes.

n. 1. Part of the Skin of a Fish, with the Scales on, adhering to a Pyrites; found in the great Clay-pit, Richmond, Surrey. This Mr. Doody shew’d to Mr. Ray; and, in his Physico-Theol. Discourses, he erroneously calls it, a Mafs of Fishes. Given me by Mr. Doody.

n. 2, 3, 4, 5, 6. Five Pieces of large Bones, seeming to be of Sea-Fishes. Found upon the Shore near Harwich-Cliffs. Mr. Adam Buddle.

n. 7. Several less. Found in the Stone-pits about Witney, Oxfordshire. Mr. Fitz-Roberts.

n. 8. A large Vertebra of a Fish. Found on the plough’d Lands near Walgrave, Northamptonshire. Mr. Morton.

n. 9. Another. Found in digging to lay the Foundation of a Wall at Welham in Leicestershire. Mr. Morton.

n. 9 x. Two Vertebrae of the Back-Bone of some large Sea-Fish, dug up near Bridport, Somersetshire.

n. 9 a. Two Vertebrae of some large kind of Fish. They have Shells affixed to them; even upon the Flats, that were contiguous while the Fish were living; so that the Fish must have been dead, the Back-Bone broke, and the Vertebrae parted and expos’d loose in the Sea, or on the Shore, for some time, before the Deluge. For these were fresh beat out of the Cliff: and there are no like Shells now living in the adjacent Creek. Found on the Shores, on the East-side of a Creek, about a Mile above Weymouth-Bridge.

n. 9 b. A Vertebra. Found at Pyrton-Passage, over the Severn.

n. 9 e. A Vertebra. Got out of the Cliffs betwixt Linton and Christ-Church, about 5 Miles from the latter. There were several others, but much rotted and impair’d: The Soil here abounding with Vitriol, which erodes and destroys these Bodies.

n. 10, 10 x, 11, 12, 13, to 21. Vertebrae of Fishes of several Sizes. Found in the Cliffs on the North-side of Sheppey-Island, Kent.

n. 22, 23, 24, 25, 26, 27. Six others, flatter, belonging to some other Species of Fish. Two or three of these seem to have been Bones of Sharks. From the same Cliffs.

n. 28, 29, 30, 31, 32, 32 x. Six others, of different Sizes. Richmond Clay-pit, Surrey.

n. 32 †. Three Vertebres, pretty large, adhering together. One of them is somewhat dislocated. There were five thus cohering when first found, but two of them are since broken off. There are Masses of the Pyrites concreted upon them. Found near 70 Foot deep, in the great Clay-pit at Richmond, Surrey.

n. 33. Two others, adhering together. From the same Clay-pit.

n. 34. A small one. From --- in Northamptonshire. Mr. Morton.

n. 35, 36. Two, pretty large ones; from the Cliffs of the Hum¬ber, near Whitton, Lincolnshire.
Another. Pyton-Passage, over the Severn, Gloucester-shire.

n. 36. Another. Pyton-Passage, over the Severn, Gloucester-shire.

n. 37. A small Bone of the Scapula Fin of a Porpus, Dolphin, or some other Fish of the Cetaceous Kind. Found in the Northern Cliffs of Sheppey-Island. This has something of a Pyrites adhering to it, as several of the Vertebrae, and Glosso-petra, found here, have.

n. 38, 39, 40. Having Pyrites adhering to them, are dissolv'd and perfor'd.

n. 41. A large Glosso-petra, or Shark's Tooth. From a Chalk-pit, at Northfleet, in Kent.

n. 42, 43, 44, to 58. Eighteen Sharks Teeth, of different Figures and Sizes. From the Cliffs on the Shores of Sheppey-Island.

n. 59. From the same Cliffs. I have seen a young Shark, taken on the Coasts near Scarborough, that had in the Jaws several Rows of Teeth, like this, n. 59. only somewhat less. That Fish was near 4 Foot in Length.

n. 60, 61. From the same Cliffs.

n. 62. Ten, from the same Cliffs.

n. 63. Eight, from the same Cliffs.

n. 64. Twenty-three, of different Sizes; from the great Clay-pit at Richmond, Surrey.

n. 65. Ten, of different Shapes and Sizes; from the Chalk-pits at Greenhithe, Northfleet, Croydon, and Purfleet.

n. 66. Another; from the great Chalk-pit at Northfleet.

n. 67. Another, broken; from a Tile Clay-pit, near Highgate, Middlesex.

n. 67. Another, fair and entire; found in a Pit of Clay, used for making Tiles, at Harrow-on-the-Hill. This Pit was in the Town; and the Workmen told me they met with these Teeth in the Clay pretty frequently: and that in sinking a Well near the Church, Shells of several sorts were found 70 Foot deep.

n. 68. In a Clay-pit, at West-End, near Hampstead.

n. 69. From the Clay-pit at Hutton, in Kent, mentioned by Dr. Hatley, Philos. Trans. No. 155. p. 463.

n. 69. Eight, small; out of a Bed of blueish Clay 30 Foot deep, in a Tile Clay-pit, near Illington, Middlesex. There were found in the same Bed turbinated Sea-Shells, and Fragments of some kind of crustaceous Shell-Fish.

n. 70. In a Tile Clay-pit in Epping-Forest, about a Mile and half from Waltham-Stow, by the Road, almost at the Top of the Hill, near the Mill. Other like Sharks Teeth I have seen, that were dug up in another Pit betwixt that and the Green-Man.

n. 71. In a Chalk-pit, on the Downs, near Smitham-Bottom, not far from Croydon, Surrey.

n. 72. From Cherry-Hinton Chalk-pits, near Cambridge.

n. 73. From a Sand-pit, at the bottom of Shooter's-Hill.

n. 73*. Found in a Tile Clay-pit, at New-Cross, near Deptford.

n. 74. From the Chalk-pits at Northfleet, Kent.

n. 75. From a Gravel-pit, near Desborough, Northamptonshire.

n. 76. Several small ones, found at Farringdon, Berkshire.

n. 77. A conical Body, of a bony Substance, a little crooked, about half an Inch long. From a Stone-pit, near Grindon, Northamptonshire. To this Kind Mr. Lhwyd gives the fantastic Name of Llettronites. (Lythophyl. Britan. Cl. 9. p. 66. & seq.) 'Tis the medullary Part of the Tooth of a large Fish. I have part of the Jaw, near 2 Foot long, with several other Pieces; found at the Depth of about 24 Foot, in a Quarry, in the Estate of Sir Tho. Read, near Shipton, Oxfordshire.

n. 78. Eight other like boney Bodies, of different Sizes. From Witney and Farrington, Oxfordshire.

n. 79. Several Bufonites, or Teeth of the Lupus Marinas. Found about Witney, and the Parts adjacent, Oxfordshire.

n. 79*. Fourteen Teeth of the Lupus Marinas, with part of the Jaw, or rather the Palate, of that Fish in which they are infix'd. From Enfon, Oxfordshire. Mr. Stonestreet. This is a very great and valuable Curiosity. Mr. Lhwyd mentions a Piece of a Jaw, with three Teeth in it; Philos. Trans. No. 200. p. 755. No. 19. & Lythophylac. p. 70. No. 1368.

n. 80. Three more; from a Stone-pit, near Grafton, Northamptonshire.

n. 81. Four oblong Bodies, seeming to have been Teeth, or Parts of boney Palates of Fishes. From a Gravel-pit, near Desborough, Northamptonshire.

n. 82. Nine other from a Stone-pit, near Grafton, Northamptonshire.

n. 83. Another from a Stone-pit, near Farrington, Berkshire.

n. 84. Six Rhomboidal Bodies of like sort. Grafton Stone-pit.

n. 84*. Another, Witney, Oxfordshire.

n. 85. Four small Rhombs. Desborough Gravel-pit.

n. 86, 87, 88, 89, 90. Five oblong Rhomboids. From a Stone-pit, near Grafton, Northamptonshire. To this Kind Mr. Lhwyd has given the affected Name of Siliquastrum. 'Tis a bony Substance.
fiance: and seems to have serv’d to cover the Tongue, or the Palate of some kind of Fish. M. du Hamel makes mention of such a sort of Coverture. “Vulpis marinae Lingua praeduris Officiuis, argenteis, non acutis, sed quadratis munitur. Vidimus Maxillas Piscis quas Clarissimam attulerat, quae fratae erant dentibus complanatis, & duris; ha Molarum infart, Cochlearum teftas quibus vefcitur es Piscis, terunt.” Vid du Hamel Physica Part. 3. Tract. 3. Dissert. 1. c. 1. p. 331. d. in 8°.

n. 91. Another, Witney, Oxfordshire.
n. 92, 93. Two more, Farrington, Berkshire.
n. 94. Found in the Gravel in Sir Ralph Dutton’s Court-yard, Sherborn, Gloucestershire.
n. 95. Another, from Farrington, Berkshire.
n. 96. Another, near Stunsfield, Oxfordshire.
n. 97. An oblong Body, black, full of very small Punta, Witney.
n. 98. Three small Bodies from a Gravel-pit, near Desborough, Northamptonshire.
n. 99. Two small boney Bodies of an irregular Figure, having their Surface thick set with Punca or little Holes. Farrington, Berkshire.

n. 100. Part of a large hard, boney Substance, seeming to have been the Palate of some Fish, having its outer Surface ridged and furrow’d alternately. The Ridges are sharp, except in the middle, and upper part, where it has been most expos’d to be fretted and worn in breaking the Shells of the Fish the Creature lived on; in which part ’tis manifestly worn down, and the Ridges smoothed. ’Tis very hard and polite: and could not have been reduc’d thus but by long time and great force. Partly by that, and partly by the bigness of it, ’tis plain this was of some grown old Fish: and had been long us’d to grinding and breaking of Shells. Found near 40 Foot deep in the great Chalk-pit at Greenhithe.
n. 101. Another lefs and not of so old and grown a Fish as the former has been. Nor are the Ridges so much worn, which indeed is but a Consequence of its not having been so long us’d. From a Chalk-pit, near Rygate, Surrey.
n. 102. Another still lefs, and probably of a younger Fish; the Ridges being little or nothing ground. Out of a Chalk-pit near Smitham Bottom, betwixt Croydon and Woodcot, Surrey.
n. 103. Another, very little; the Ridges entire, and with their Edges very sharp. From the same Chalk-pit near Rygate, with 101.
n. 103*. Part of a flat Tooth: or rather Grinder of a Palate. The Ridges and Eminencies of this are worn down by grinding, tho’ it be small; so that it seems to be of an old grown Fish, that had us’d and worn it long. Consequently ’tis probable the Kind have several of these Grinders, lefs, and larger, distinct, in the same Jaw. From a Chalk-pit, on Boxly-Hill.
n. 103†. A Tooth, found in the same Chalk-pit with n. 102.

Z 3

n. 103.
n. 103. A bony Body, flat on one side, and convex on the other, the latter thick set with small Cavities in a very beautiful Manner. Out of a Chalk-pit near Epsom, Surrey.

n. 104. A Mafs of Stone made up almost entirely of the little round Pellicules of the Ova of Pitches, fill'd with a fine stony Matter. There are in it some Particles of Spar, and Pieces of the Shells of Bivalves: or rather Spar that has succeeded in the room of those Shells, when perished and gone. Broke off a Stratum of Stone in the Quarry near Nunmington, Yorkshire. Stone thus set with Ova has pass'd amongst the Writers of Nat. Hist. by the Name of the Hammites. — "Gruppo d'Ova di sepià petrificata, Musée Colpiando - - - - - vid. Ketton-stone, in Dr. Hook's "Microgr. p. 93. Hammites Ovis plicium similis eft. Plin. L. 37.

n. 105. Another Piece of Stone with small Ova in it. From Desborough.

n. 106. Another, out of a Quarry near Shipton, Oxfordshire.

n. 107. Another, from a large Quarry, near Northleach, Gloucefshire. In this Quarry there are vast Strata, near the Surface, all full of these Ova.

n. 108. Another of a faint Purple Colour. From the great Quarry at Ketton, Northamptonshire.

n. 109. Another, yellow. From the same Quarry.

n. 110. Another, yellow. Found near Burleigh House; on the Edge of Lincolnshire.

CLASSIS XI.

Quadrupedum Partes.


a. 2. Part of a large Tusk of an Elephant. This with its fellow of the same Size were dug up at Bowden Parva, Northamptonshire. They lay in an horizontal Poffure in a Stratum of common Clay, above which was a Stratum of Gravel; and over that a Stratum of blue Clay. They were pretty entire when found, and each 16 Inches in Circumference in the thickeft part. But being decay'd, this was shatter'd and broken in the Carriage. Mr. Morton. He search'd the Clay that was dug and flung out there, but could find no other Teeth or Bones, but good store of Sea-Shells. The Stratum of Clay in which they lay was not above 3 Foot below the Surface. They were neither of 'em entire, the 2 Ends of each being broken off before he faw them. And consequently the thickeft part was loft and gone, as well as the smallest. And yet 'tis very rare to meet with an Elephant's Tooth in any part 16 Inches about. So that these must have belong'd to a very large Creature. See the Lecture about Ebur Fossilis.
A letter Piece of the fame Tooth.

Several Pieces of an Elephant’s Teeth dug up in a Gravel-pit at \textit{Islington}, about a Furlong N. W. of the Well call’d \textit{London-Spaw}. It lay about 8 Foot deep. There were several Bones with it.

Part of the Thigh-Bone of an Ox, dig’d up in a Gravel-pit, in \textit{Windfor-Park}.

Dug up in another Gravel-pit at the same Park. These lay about 14 Foot deep.

Found seven Foot deep in a Gravel-pit, near the Mill in \textit{Windfor Field}.

A Shank-Bone digg’d up, along with Nuts, and Branches of Shrubs, 6 or 8 Foot deep, in sinking the Wet Dock, near \textit{Deptford}.

A Piece of a Bone found eighteen Foot deep in a Gravel-pit, near \textit{Chelsea-College}.

A small Bone and 2 small boney Polyhedrons Bodies, out of a Stratum of Stone, about 10 Foot deep, in a Quarry, near \textit{Broadwell-Grove}, Oxfordshire.

A Fragment of the interior or porous Part of a Bone, tinged of a fine bright green Colour. Found in a Copper-Mine in \textit{Cumberland}. Thofe boney Bodies that are found amongst Copper-Ores in the Earth, are frequently tinged with green or blue, the Colours that that Metal naturally gives. The Turcois Stone, as it is commonly stiled by Lapidaries, is no other than part of a Bone so tinged. See the Account of that Body in the Catalogue of the foreign Fossils, p. \textit{- - - -} as also of a Bone dug up in the Copper-Mines of \textit{Hungary}, tinged green, \textit{ibid.} p. and of another found lodg’d at a considerable depth under a Stratum of solid Stone, at \textit{- - - -} in \textit{Yorkshire}, in a Letter of Mr. \textit{Thoresby}, dated Nov. 9. 1702.

A Piece of a Bone, found, among several others, in a Stratum of solid Stone in a Quarry near \textit{Caple-Tar}, Cornwall. It has several Spots of green upon it, which are no other than Efflorescencies of Copper-Ore. There were some small Veins of Marcasite, with a few Strings of green Copper-Ore, in the same Quarry: and \textit{Caple-Tar Gold Mine}, as ‘tis call’d, is not far off. See a Sample of the Marcasite got in that Mine, in the former part of this Catalogue, p. \textit{- - - -} The Stratum in which these Bones were lodged was above 100 Foot deep.

\textbf{CLASS IS XII.}

\textit{Corpora Marina, præsertim Conchylia Masse lapides confertim immisra.}

\textit{p. 1, 2, to 10.} inclusive. Ten Masses of a reddish hardned earthy Matter, containing in it Entrochi, Sea-Shells, and Impressions of them, Corallina, the Sea-Fan, and other like Bodies. From \textit{Stanton, Cumberland}. Sent by Bishop \textit{Nicholson}. Dr. \textit{Fluenet}, Mr. \textit{Stonesreef};
Stonestreet, Mr. Doody, and Mr. Buddle, assert that these Bodies are real. p. 5. has in it a Pinna of a Plant of the Fern-kind.

p. 11. Small Fragments of Shells; and a white reticular Body, appearing to be part of a Sea-Fan, in a blackish hardened earthy Mafs. Found by the sides of a Brook about 50 Yards from a Farm-Houfe, called Threpland in Westmorland. There's more of it in the same Banks. Dr. Plukenet, and the other three Gentlemen above named assent also to this, and to what follows at p. 12.

p. 12. Another like Mafs from the same place, with part of a Sea-Fan also in it: and the Impreflion of an Entrochus.

p. 13. A grey stoney Mafs, very hard, full of Shells, worn by the Agitation of the Sea. Found on the Shores near Scarborough, Yorkshire. This, and the following to p. 22* are not properly Pebles, or of the original Nodules, that were form'd in the Water at the Deluge, [vid. Nat. Hist. Earth. Part iv. Conf. 2.] but are only Lumps of hard Stone, broken off from the Strata: their Surfaces smooth'd and the Bodies ground into this Form by the Sea's agitating and rolling them to and again upon the Shores.


p. 15. Another. Found on the Shores near Owthorn, Yorkshire.

p. 16. Another, from Owthorn Shores.

p. 17. Another, brown. From Owthorn Shores.

p. 18. Another, reddish, from Owthorn Shores. The Shells in this appear with a talky Gloss: and are probably constituted by Talc, the fefaceous Matter being dissolv'd, convey'd away: and succeded by this talky Spar, brought by Water pafling the Stone.

p. 19. Another from the fame Shores. The Shells here are consumed and gone, and the Places of them fill'd with a white talky Spar.


p. 22. A small Mafs of a grey Stone, with two Shells of fome Bivalve, very white, so worn as to appear like two C C: From the Northern Shores of Sheppey Island, Kent.

p. 22*. Another, very large, with feveral sorts of the Bodies exhibited in the 6th Class above, i. 1, 2, 3, & seq. in it. Owthorn Shores.

p. 22 †. Another, lefs, with like Bodies in it. Owthorn Shores.

p. 22 *. Another, with Bodies of fll the fame kinds in it. Found on the Yorkshire Shores of the River Humber, near Paul.

p. 23. Part of a dark grey Stone. There were small Bivalves in it; the Shells whereof, being perifh'd and gone, are succeded by a shinning brassy Pyrites. Out of a very thick Stratum of Stone, in a Quarry near Bakewell, in the Peak, Derbyshire.


p. 25. Another, Clipfon-Quarry, Northamptonshire.

p. 27. Another. From the Stone-pits at Tick-Marsh, Northamptonshire. This lay only a Foot deep: and 'twas taken up by Sir John Pickering, who observed them lying as thick thence to 6 Foot deep, which was the bottom of the Pit.

p. 28. A single Shell taken out of the precedent Mafs.

p. 29. A Mafs of Stone very thick set with Shells, out of a Quarry, near Fairford, Gloucestershire.


p. 31. Another, near Southampton. There are amongst Fragments of other Shells, two Valves of the Chama, lying in this open'd and display'd.


p. 34. Ibid.  p. 35. Ibid.

p. 36. Whiston Shores, Lincolnshire.

p. 37. A Mafs with Concha Anomia, lying very thick in it. Sherborn, North Field, Gloucestershire.

p. 38. Another Mafs thick set with various Shells, out of a Lead-Mine, near Worfswork, in the Peak, Derbyshire.

p. 39. Another, thick with striated Concha Anomia, some of them filled with white Spar. King's-Wefton, Gloucestershire.

p. 40. Another. Some of the Shells having in them likewise white Spar. Gritworth, Northamptonshire.

p. 41. Another Mafs, holding Concha Anomia, in great Numbers, both of the levu; and striata, a kind of Oyster-Shell, and other Bivalves. Barrington great Quarry, Gloucestershire.

p. 42. Another, out of the fame Quarry.

p. 43. Another, wherein are various kinds of Bivalves: and a long, fair Spike of an Echinus Oarius. Found, above 30 Foot deep, in a Quarry near Farmington, Gloucestershire.

p. 44, 45. A Mafs of Stone, broken in two, and shewing in it several Shells of some sort of Bivalve. King's-Wefton, Gloucestershire.

Sir Robert Southwell.

p. 46, 47. Another, likewise split in two. In this have been many Shells; but they are much decay'd, and but just discernible. Hinderskef, Yorkshire. Mr. Groome.

p. 48. A Mafs of black Stone, having in it partly Shells, very thick: and partly Spar, succeeded into the room of Shells decay'd: and succeeded by a sparry Talc. Found among the Rubble of a Coal-pit at Adderton, Yorkshire. The Colliers say that it lay four Fathom deep, just over the Coal.

[A] p. 49. A Mafs consisting almost entirely of common Oyster-Shells, the Intervals only being fill'd with Sand. From a Rock two Miles distant from the Sea and 200 Foot above it. Weymouth.

p. 50. Ibid. In this are several very different Shells, both Bivalve and Turbinata.

p. 51. Ibid.

p. 52. Whiton-Cliff, Lincolnshire.

p. 53 & 54. Bp Nicholson. From the Diocefe of Carlisle. In these
these two Masses, the Shells are very much decay'd; there remaining little more than Impressions of them. By such as these Dr. Lister was misled into the Notion that Fossil Shells were not real, but mere Umbra, Imagines, and I know not what. Vid. Lister Hist. Animal. Angl. Trad. 4. p. 243. See an Icon of this kind, Tab. 9. Fig. 49. Conf. p. 130. infra.


p. 56. Found in the Home-Park of Sir Ralph Dutton. Sherborn, Gloucestershire.

[A] p. 57. A Mass with Cochliitae in it. Petworth, Sussex. These seem to have been moulded in the Cochlea fasciata vivipara fluviatilis, Listeri Hist. Conchyl. fluv. No 26. There are of this sort in the Cliffs of Hampshire. See the Catalogue of the Shells found there. No 25.


p. 59, 60, 61, 62. Masses of Stone, out of Portland great Quarry. The Stratum off which these were broken, lay 50 Foot deep, about 200 Foot above the Sea. They are thick set with Stones, of the same Constitution with that of the common Stratum, chiefly in long slender turbinated Shells, and in that Bivalve that Dr. Plot, Nat. Hist. of Oxfordshire, calls Hippocephaloides. The Shells are all perish'd, but the Space they posse's'd, is left empty, except where accidentally fill'd since.

[A] p. 63. A Mass, wherein are several of the common Pecten, or Escalop-Shells. From --- Northamptonshire.

p. 64. A Mass of a brown Colour, with Shells, and several Belemnitæ in it. Some of the Belemnitæ are broken so as to discover the Striature and Texture of their Crusts. Gristworth, Northamptonshire.

p. 65. Another, with Shells and Belemnitæ. Ibid.

p. 66. Another, Ibid.

p. 67. Another, with Shells, and a piece of Wood, being part of the Branch of some Tree. Ibid.


p. 69. A Mass with Afteria, those call'd the Wires, of this Body, and various Kinds of Shells. Oxenden Gravel-pit. Mr. Morton.

p. 70. A Mass with several fair Shells in it, of different Kinds. I have a Drawing of it, by Mr. Faithorn: But since that was made, the Mass was accidentally broke in two, by a Fall, and one or two of the Shells shatter'd and defac'd. Out of a Stone-pit on Cowley-Common near Oxford.

p. 71. A Mass of Stone having great Variety and Plenty of Shells, chiefly Bivalves with some turbinated, and Ova of Fishes in it. Found upon the plough'd Lands, on the Brow of a Hill in the Fields, on the West-side of Sherborn, Gloucestershire.
p. 72. Another, as thick set with Shells, Bivalves, turbinated, Echini, and Ova. Windrush, Gloucestershire.

p. 73. Another. Stawel, Gloucestershire.

p. 74. Another, this was part of a Stone struck out of a Wall near Sir Ralph Dutton's Houfe, Sherborn, Gloucestershire.

p. 75. Another, with Ova of Fishes, and several very fair and beautiful Shells, both Bivalve, and Turbinate. From a Quarry near Windrush, Gloucestershire. I have a Drawing of this, by Mr. Faithorn.

p. 76. Another Mafs, thick set with Shells of the Bivalve kind. Hampnet, Gloucestershire.

p. 77. Another, exhibiting two fair Valves. Northleach, Gloucestershire.

p. 78. A Mafs thick set with Variety of very fair Shells. Found in Woodstock-Park, Oxfordshire.

[A] p. 79. A Pyrites, very thick set with small or young Shells of that sort of Bivalve that Dr. Lister, Hist. Animal. Anglia. p. 173, calls Choncha à maximis, admodum crajfa, rotunda, ex nigro rufescens. And large grown Shells of this Kind are found plentifully in the fame Pits. Conf. N° f. 433. & seq. Thofe contain'd in this Pyrites, are all of much the fame Bignefs; and something exceed a large Pea: To which Size Mr. Haslings affures me, the young of this Species of Shell-fish naturally arrives at the End of May. So that these were kill'd, and a Stop put to their Growth at that time of the Year; which is the time affign'd by Moses for the breaking forth of the Deluge. This Mafs was found in the great Clay-pit by Richmond-Wells, Surrey. Mr. Doody. All that I have ever seen of this Species that are, under a Year's Growth, are of the Size of these. I have met with great Numbers of such in thefe Pits.

p. 80. A gritty Mafs, having in it a fair Peçtunculus, and part of another. This, and the following, to p. 86 inclusive, were given me by Mr. Jackson, vid. c. 29. supra.

p. 87. Found in linking a Well at Bromly in Kent. Mr. Emmet.

p. 88. A Mafs of grey Stone, part of a Stratum near the Road, at the West-end of Stifford, a little of this side the Rivulet, Essex. The following Mafles to p. 102 inclusive, were all parts of the fame Stratum, and contain in them a great Variety of Shells, both Bivalves and Turbinate, generally well preferv'd, this Stone being ordinarily very firm and hard: and in breaking this Stone, I once obferv'd a Shark's Tooth very fair and entire.

p. 89. Ibid. p. 90. Ibid. p. 91. Ibid. p. 92. Ibid.

p. 93. Ibid. In this, one or two of the Shells have Delineations of Shrubs, made on them by the afcent of fuliginous Steams.

p. 94. Other like Delineations very fair. Ibid.

p. 95. Ibid. p. 96. Ibid. p. 97. Ibid.

p. 98. Ibid. There are fuliginous Delineations on the Shells of this likewife.

p. 99.
p. 99. Ibid. This has in it several large flat Shells which lie parallel one to another, and to the Grain, and Horizontal Situation of the Stone. The same is observable in several of the preceding, and in the 3 following Masses.

p. 100. Ibid.

p. 101, 102. These, tho' very large, cohered to each other, till broken asunder, and parted. Ibid. I have observ'd of the same sorts of Shells with those in this Stifford Stone, in the great Sand-pit near Woolwich; and in another Sand-pit at the Foot of Shooter's Hill, as also in several parts of Black-Heath. And Mr. Derham sent me several pieces of Stone, not unlike this; in which also were of the very same sorts of Shells, found five or six Foot deep, in digging a Ditch at Orset, which is about 3 Miles East of Stifford. So that 'tis very likely they were in so great Numbers diffus'd over all that Tract of Land from Woolwich and Black-Heath to Orset, for almost 20 Miles in length.

p. 102*. A piece of the harden'd Marl, as it is called by Dr. Hatley. He has given an Account of it, Philos. Trans. No 155. p. 463, as composing a Floor or Layer, about an Inch in thickness; having in it Shells and Impressions of both the bivalve and turbinate Kind. Hunton, Kent.
De ingenti Rerum Marinorum, in eodem Lo- 
co, Telluris Visceribus commissorum, Nu-
mero, & Diveritate,

MANTISSA PRIMA.
Sive Conchyliorum quorundam in Agro Han-
tonenfri erutorum,

CATALOGUS.

PRÆFATIO.

Exhibet brevis Æfle Catalogus amplam Conchyl- 
orum Messem ex Agro Hantonensi reportatam. Telluris Visce-

Tanta eorum Varietas, tot Species, imo & Ge-
era tam longe diversa, omnia, si non in eodem Lo-
num, Nume-
co, in eadem certe Viciniae congerfa, aliquam primo 
us, & Varie-
salem intuitu Admiracionem incitant: eos majo-
tas.

rem quod Numero adeo ingenti Species JinguU tan-
taq, Copia eruntur. In nonnullis etenim Stratis ita abundant ut 
an Materiam Terrejirem, cui committuntur, mole non (uperent
merito dubitandum videatur.

Qua tamen Admiratio cessabit pror-

Luq; quod in Telluris Visceva pertigerunt bae ce-
eraq; Maris Spolia, nondum est compertum. Ex

verum reperiri ad maximam usq; Profunditatem,
quò usiam fodziendo pervenitur, certum est. Neq
in Terra, in Marge, autarena Stratis frequentiore
unt quam in Saxi, etiam durissimi. Hujus Rei Do-
dumenta Plura, & Exempla, alio Loco * proposui.

Et quum Stratis saxeis, alijsq; etiam durissimis, eo-
dem plane modo commissa sunt, atq; arenaceis & 
reliquis laxioribus, Saxea illa, ceteraq; itidem olim 
laxa fuisse arque soluta liquido confiat. Reperiun-
tur quoq; Conchylia in Montibus, & ad Summa,
etiam altissimorum, Fafligia atq; Vertices; idq; per totum Telluris 
Orben; certo Indicio Conchylia bac omnia fuisse allata, strataq;
compilata, à Diluvio universali.

* Vid. g. 4, 12, 13, 14, 15, in the Catalogue of the additional 
eextraneous English Folils.

Horum
De Hantonen- 

Horum nostrorum Hantonensis Pars maxima est 

sibus Relatio 

Clivis Milfordianis & Hordwellianis erubebatur. 

Reperiantur quos exinde perplura Stadia versis 

Crift-Church; quam longe ulterior, aut per Littora, aut per Media Regionis Vifcera, diligentiore facto scrutinio patet. Hoc certum est Conchylia in aliis Regionibus, pari numero, & varitate, detecita esse per multa ubijs; Pasium Millia. Clivi 

isti Hantonensis in locis nonnullis editissimi sunt: eorum; Stratis commissa cunctur Conchylia per plures deorum Orugas ad nq; Mari 

ris superficiem; profundus inquirendi nulla fse obruit occasio. Strata 

hae, tum fæacea, tum quos; arenacea, ceteras; omnia, fide in- 

vicem parallela jacent, & ab horizontali situ parum declinantia. Ex Stratis, Mariß Æflum & Procellarum Vi, pulsa, quo modo de 

succino alibi* notavi, Conchylia paffim in Littore diffcrsa comperant.

Neg; cui piam mirum videatur tot Marinorum 

Conchylia 

quamodo 

ram diu con- 

servata.

Inter Hantonen- 

nia Conchy- 

lia plura ab 

Occidente & 

America.

Cataclysmus, 

Britanniam 

inundans, ab 

Occidente.

Ad Notam, qui 

quando 

invenisse, 

quibus fami 

sumus, quia 

ab illis quam 

Dottiffimus 

Rumphius in Hiftoria Naturali Amboyna 

exhibuit, param ablu- 

dit. Sed hac nostra, quantumvis similis, non ejiudem omnino Spe- 

ciei est cum Amboyensi illa. Nec ejiudem si ejusdem fruejet 

Specti qui quorum certe inde revera circa nius nostra Originem erat 

concludendum, quam aliqua sunt Tefla & America & finum Indie 

orientali communies: at; in utraq; illa quantumvis distantì Regione, 
bodie viventes observantur.

* Nat. Hift. of the Earth. Part IV. sub finem. 
† Pag. 96. Tab. XXIX. F.

Unum adhuc monendum reflat, ut si quid in se-quenti horum Conchyliorum Descripitione, & Cha- racteribus concinnandis peccatum censeant elegantiorum Literarum Studiorum Doctoris, a me, liliereiana+ presse nimis insistendo, hoc non mihi vitio vertendum; quia hujus Vriri, tam docti, & Naturalis Historia Conchyliorum Indagatoris tam diligentis, scripfa ab Eruditis omnibus probentur, ejusq; des Rebus Authoritas adeo rata sit & sancta ut quasi Veri & Reél Norma ab omnibus jam demuo recipitur.

P.S. Per media Regionis Visera, &c.] Per totam hanc Regionem, circa Limington, imo in omnibus ferè Locis Novi Saltus, [the New-Foreft] passim vissunt Fodina e quibus Marga eruitur. In his ferè omnibus, simul cum Marga, Conchylia Marina Copiose Effodiantur.

Una cum Conchylis in Agro Hantonensi, reperiuntur etiam Verteb- brae, & Dentes Pisces Marinorum; de quibus, Vid. n. 9°. supra, & N° 64. infra.

Conchyliorum quorundam Marinorum, e Terrae Visceribus, in Agro Hantonensi, erutorum,

CATALOGUS.

CAP. I. Bivalvia.

1. Pecten, parvus, Auriculis ex altera parte majoribus.
2. Ostreae fulcatae, Arborei vulgaris dicti, Species.
3. Ostreae arboreae alteri, crebrii fulcatae.
4. Ostreae parvae, laeves, minime fulcatae.
5. Ostreae cujusdam oblongi testa inferior seu plana, superficie exteriori ad tactum aspera.
6. Ostreae ut videtur, Sylvestri Rondeletij.
9. Alter ejusdem generis minor, striis rarioribus.
10. Alter minor, striis crebrioribus.
11. Pectunculus Polyleptoginglimos, formâ oblongâ, Musculus Matthewi diâtus, tenuiter striatus.
12. Pectunculus laevis, parvus admodum, ambitu rotundo.
13. Pectunculus laevis alius, parvus, ex altera parte paulo producitor.
14. Pectunculus tenuiter fasciatus, vertice multum recurvo.
15. Pectunculus minimus fasciatus.
17. Lapis Telliniformis, cujus superficie Reliquiae quaedam Testae nitidae adhaerent.
18. Tellina, parva, laevis.
19. Tellina alta, minuta, tenuiter fasciata.
20. Tellina fasciata profunde fulcata, altera parte in Angulum excurrente.

CAP. II. Conchyla, Testâ simplici, non tortilia.

22. Patella Ambitus, rotundo, septo quodam intus sinum exiguum includente.
23. Patella quaedam, ut videtur, admodum compressa.

CAP. III. Tortilia, seu Turbinata.

24. Cochlea umbilicata, Claviculâ brevi.
27. Cochlea striata, Clavicula longissima, Orbibus tumidioribus,
    seu pulvinatis.
28. Cochlea striata, Clavicula longissima, Orbibus planis seu minus
    eminentibus.
29. Cochlea minima, laevis, Clavicula longissima.
30. Cochlea laevis, Clavicula longa, Ore pyriformi, Texta tenuis
    sima. Tenuitas, eastera, hujus Textae Indoles, arguit eam esse
    ex fluviatilium vel lacustrium Classe oriundam.
31. Cochlea parva, striata, Clavicula modice producet, Ore pyri-
    formi, Columella dentata.
32. Trochus Pyramidalis, Basi plana, Tuberculis minimis obtusis.
33. Concha Veneris, ore angusto, utrinq; dentato.
34. Rhombus, Cylindraceus, tenus.
35. Rhombus Cylindro-Pyramidalis, parvus, asper, Clavicula mo-
    dic6 producet.
36. Buccinum, Muscum dictum, Columella dentatd, ad Clavicu-
    lam muricatum.
37. Buccinum, Muscum minus, non muricatum, labro dentato.
38. Buccinum Clavicula longissima, Tuberculis obtusis, ore subro-
    tundo.
39. Buccinum, minimum, asperum, Clavicula longissima, ore an-
    gufto.
40. Buccinum Clavicula longa, striatum, ore oblongo angusto.
41. Buccinum cancellatim tuberculatum, Clavicula & Rostro mo-
    dic6 producetis.
42. Buccinum laeve, Clavicula longissima, Orbibus planis.
43. Buccinum laeve, Clavicula modice producet, orbibus tumidi-
    oribus.
44. Buccinum parvum, secundum Orbes striatum, Rostro brevi,
    ore subrotundo.
45. Buccinum, parvum, tenuerit striatum, ore angusto.
46. Buccinum, parvum, secundum Orbes striatum, transversi
    fulcatum, Rostro brevi.
46x. Buccinum, parvum, Rostro & Clavicula brevis, primo
    Orbe transversile leviter fulcatum, & ad Claviculam depressi.
47. Buccinum laeve, Clavicula & Rostro brevis, primo Orbe ad
    Claviculam depressi.
49. Buccinum laeve, Clavicula & Rostro longis, ad Claviculam mu-
    ricarum.
50. Buccinum, striatum, Clavicula longa, inconcinna, feu Orbibus
    inaequalibus.
51. Buccinum Clavicula & Rostro longis, secundum Orbes stria-
    tum; transversi fulcatum.
52. Buccinum, craffum, laeve, Clavicula & Rostro longis, Orbibus
    singulis ad Claviculam in Angulos acutos depressi.
53. Buccinum Clavicula & Rostro longissimi, striatum, Tubercu-
    culis in medio quoq; Orbe asperum.
54. Buccinum Clavicula & Rostro longiflimis, minus, cancellatum striatum.
55. Buccinum Clavicula & Rostro longis, parvum, secundum Orbis striatum, transversim sulcatum.
56. Buccinum, parvum, Clavicula longiflima, ore longo angusto, secundum Orbis tenuissime striatum, transversim sulcatum.
57. Buccinum, parvum, Clavicula longa, tenuissime secundum Orbis striatum.
58. Buccinum, parvum, Clavicula & Rostro longis, Orbibus ad Claviculam tuberculatis.
59. Buccinum magnum, Clavicula longa, cujus Orbis plani sunt, & minime puvinati, labro latissimo, & usque ad Apicem Claviculae producere.
60. Buccinum Clavicula & Rostro longis, primo Orbe in Limbume acutum, juxta Claviculam, excurrente.

Appendix. 1722.
61. Buccinum juxta Orbium Duérum striatum, & muricatum, Claviculæ & Rostro brevisibus.
63. Buccinum Echinatum.
64. 3 Glossopetrae, 5 Canum Marinorum Dentes.

Appendix alter. 1724.
65. Ostrei cujusdam Valvula superior.
66. Ostrei forfan Anglici, Valvula inferior.
67. Pectunculus.
68. Testudinis, alius Americani, Testae Segmentum, Effossurus ex Clivo Hordelliano.
Rerum aliquot Fossilium in Itinere Septentrionali D. GROOME & D. MEULIS Anni 1700. Collectarum,

MANTISSA ALTERA:

Exhibens Conchylia Marina varia in Summorum Monstrium Pendle, Ingleborow & alior. verticibus; in profundissimis Fodinarum latebris: & ex Agris Nunnington, Bugthorp, alisq; à Cl. V. M. Listero recentiis in Lib. de Conchitis, & in Aëris Philos. N° 76.

p. 103. A Piece of grey Stone, with several Impressions of striated Conche Anomis in it. Found on the very Top of Pendle-Hill, about 20 Yards North of the Beacon. This is the common Stone of the Hill; in all which there are like Impressions in great Numbers.

p. 104 & 105. Two Pieces of Stone, each having the Impression of a pretty large Bivalve upon it. These were taken, from amongst many more with such Impressions, out of Stone, within a few Yards of the Top of Pendle-Hill.

p. 106. A Piece of Stone, with the Shell of a pretty large Bivalve upon it, and Joints of many small Entrochi in it. Struck out of the Rock, within 60 Yards of the Top of Ingleborow-Hill; in which these Marine Bodies are pretty plentiful.

p. 107 & 108. Two small Pieces of the same Stone, each with the Impression of a Bivalve upon it. From the same Rock.

p. 108 & 109. A Piece of Stone, from still the same Rock, with a great many Entrochi in it, and the Impression of a Shell of a Bivalve upon it.

p. 109 & 110. Two Masses of Stone, very thick set with Shells, and Entrochi, broke off the very Top of a Rock, about 20 Yards in perpendicular Height, near Engleton in Yorkshire. All the Rocks thereabouts are pretty thick set with Shells; but few of them fair, or so well preserved as they are commonly found in some other Countries.

p. 110 & 111. Another like Mass; from the Top of the same Rock.

p. 111. A Mass with several Shells, and two very large, in it. Found, amongst many more of like sort, on a Hill by the Allum-Mines, at Kirby on the Brow, Yorkshire.

p. 112. Another, with Shells and Impressions. Found on the side of Hildern-Hill, near Scarborough, Yorkshire.
p. 115. Impressions of several sulcate Concha Anomia, on Stone.

p. 114. Impressions of Escalop-Shells. Found near the former.

p. 115 & 116. Two Masses, very thick set with Shells, out of a Stone-pit at the top of Hackness-Head. All the Stone in this Pit, and about the Hill, is very full of Impressions, and of Shells, tho' few fair, or well preserved.

p. 117. A Piece of Stone, with the common Oyster-Shell in it, taken out of a Stone-pit at the Top of a high Hill near Silske, Yorkshire.

p. 118. Impressions of various Kinds of Bivalves, on Stone.

p. 119. A Mass of Stone, full of Shells. Found under the Moss-Earth, amongst others of like sort, at the very Top of Suffield-Hill, which is very steep and high. 'Tis not far from Hackness, Yorkshire.

p. 120, 121. Two Masses, very full of Shells. Found on the Top of a high Hill, near Silske, Yorkshire. There lie of these loose Masses of Stone, immediately under the Turf-Earth, great Numbers. They are laid bare by the Diggers in the Turf-pits.


p. 123. Found at the bottom of Nunnington Quarry, Yorkshire: A Nautiloides.

p. 124. A Stone, thick set with Ova of Fishes; having likewise part of the Shell of a Pecten adhering to it; but neither so fair as commonly they are found in many other Countries. From the bottom of the same Quarry.

p. 125. An Impression of a Bivalve, on Stone. From the same Quarry.

p. 126. Part of an Ammonites. From the Bank of the River, near Bythorp, Yorkshire.


p. 128. A Mass of Stone, having had several Shells in it, which are now perished and gone: but their Impressions, and the void Spaces they heretofore fill'd, are very observably. Found near the Top of a high Hill, two Miles West of Stokesby, Yorkshire.

p. 129. The Impression of a large Shell, on Stone, very thick set with Entrochi. From Thorp-Edge, Richmondshire.


p. 133. Impressions of two Bivalves, on a Piece of black Stone, with small Sparks of Mica in it, being Part of a Stratum of Chitter that lay 71 Yards deep, at the bottom of a Lead-Mine, (farm'd by Mr. Langstaff,) on Moulderside-Hill, Arkendale, Yorkshire.

p. 134. A Piece of the same sort of Stone, with the Impression of a large Bivalve upon it. Found at the same Depth, in the same Mine.

p. 135. Part of a blackish stony Nodule, with Impressions of several Bivalves upon it. It lay 40 Fathom deep in a Coal-pit at Benwell Coalety, near Newcastle.

p. 136. Part of Stone of an Iron-grey Colour, with extreme small Sparks of Mica in it, and an Impression of two small Bivalves upon it. Found likewise 40 Fathom deep, in the same Coal-pit.

p. 136*. An Impression of a Bivalve upon a very hard brown Stone, being part of a Stratum that lay 40 Fathom deep, in a Coal-pit in Benwell Coalety, by Newcastle.

p. 136*. An Impression of a Bivalve, of a Species different from the foregoing, upon a dark grey Stone; the Stratum of which lay somewhat deeper than the former, in the same Pit. There were many more Impressions, in both this and the above-mention'd Stratum.

De Testis aliisq; Animalium Marinorum Partibus incerti
Generis,

MANTISSA TERTIA.

p. 137. Part of a testaceous Body, with Fibres running diametrically cross it, in manner of the Pinna Marina. From the great Chalk-pit at Greenhithe, Kent.

p. 138. Another. From the great Chalk-pit at Northfleet, Kent.

p. 139. Another. Greenhithe, Kent.


p. 141. Another. From a Chalk-pit, not far from Epsom, Surrey.

p. 142. Another. From a Chalk-pit near Croydon, Surrey.

p. 143. Another. From a Chalk-pit near Charleton, Kent.

p. 144, 145. Two others. From a Chalk-pit near Rygate, Surrey.


p. 148*. A large Piece of a Body of the same Kind, as also several smaller Pieces, immer'd in a black Flint. Found betwixt Northfleet and Greenhithe, Kent.

p. 149. A Piece of another. From a Stone-pit on Bullington-Green, near Oxford. Mr. Lhwyd sent it with the Name of Trihites Ploticus Hift. Oxon. Veneris Crines forsan Plinio. These two Writers, Dr. Plot, of meer Simplicity, and Mr. Lhwyd, of Design, Wurken Council by Words; Job xxxviii. 2.

Aa 3
A small Piece, struck out of a Stratum of Stone, in Burlip-Hill, betwixt Cirencester and Gloucester.

A Piece, less, and thinner; out of a Stone-pit, near Reading, Gloucestershire.

An Impression of a Fragment of this Body, in a grey Flint, Hampstead-Heath.

An Impression, seeming to be of that part of this sort of Body where the Valves are, on a Flint. Found near Dulwich, Surrey.

A Piece of a Shell, thick set with small Papilla all over the Outside of it. From the great Chalk-pit at Greenhithe, Kent.

Three or four small oblong boney Bodies, lying parallel to each other, on a Piece of Chalk. Northfleet, Kent.

Three Bodies, with Sulci and Ridges alternately on the Surfaces, so as very much to resemble Segments of Ammonite, only one of them is freight; and the other two, tho' somewhat inflected, not near so much as the Volute of the Ammonite. The freight one is parted at a Suture, and exhibits a Diaphragm, unequal, and like those of that Body. Falkstone-Cliffs, Kent.

An oblong round Body, incircled with annular Ridges and Furrows alternately. This is one of those Bodies that are call'd, tho' improperly, Screw-Stones. From a Lead-Mine, near Worksop, in the Peak, Derbyshire.

Six, lesser. From the same Mine.

From the same Mine.

Seven Screw-Stones. King's-Weston, Gloucestershire.

Seven Masses of Stone, with Screws in them. Ibid.

Another, with the Screw in it, seeming to be comprized by some external Force. Ibid.

Two Screws, taken out of the Stone of the eleventh Stratum of one of Col. Byerly's Lead-Mines, on Richmond-Moore. They were pretty thick in the Stone of this Stratum, which lay about 30 Foot deep.

A Piece of the Stone of this Stratum, with Screws in it.

A Limestone, of a grey Colour, and very hard; having in it some small Entrochi, and several Screw-Stones. From Overton, in Scarfdale, Derbyshire.

A Screw-Stone; found, along with Entrochi, at Moreland, in Westmorland. Dr. Nicholson, now Lord Bishop of Carlisle.
De Conchyiis Fossilibus aliqua Injuria affectis, quippe attritis, erosis, compressis;
Mantissa Quarta.

Sectio I.

Conchylia Maris et fu agitatione antequam Massa Saxex mandarentur abræsa attritaque.

p. 177. This, and the four following, were given me by Mr. Jackson. Vid. c. 29. supra.


p. 182. Out of a Mafs of Stone, in a Quarry near Burford, Oxfordshire.


p. 184. Found in a Stratum, consisting chiefly of Sea-Shells of various Kinds; some of which were worn, as this is, underneath a Stratum of solid Stone, above 40 Foot deep, in the great Quarry at Barrington, Gloucestershire.

p. 184*. From a Stone-pit, near Abbington, Berkshire.

p. 184*. Out of a Mafs of shatter'd lax Stone, in a Quarry in Tangly-Fields, Oxfordshire.

Sectio II.

Conchylia antequam Saxo committerentur a Vermibus erosæ.

p. 185. This Mafs was very large, and had many Shells in it, of which none had the least Sign of being eroded, besides this Patella. Mr. Jackson. Conf. N° c. 29. supra.

p. 186. Barrington. Found in the fame Bed of Shells with p. 184. supra. I saw but one, besides this, that had any Marks of these Depredations upon it; tho' I examin'd great numbers of them.

p. 186*. Out of a Mafs of Stone, very close and compact, but with Vitriolic Salts in it, which began a little to yield and shoot, so that the Stone shatter'd to pieces in breaking, and the Shell was easily got forth and clear of it. These Salts would annoy and offend any Insect that should attempt preying upon the Shell whilst in it: besides 'twas so closely beset with Stone, that none could well come at it. So that the Erosions that are in this Stone were made before the Shell was repolished in the Stone. Gatcomb, Gloucestershire.

Sectio III.

Conchylia à vi quadam externa compressa & disclcta.


p. 188. Concha anomia. Out of a Mafs of Stone in Randcomb-Park, Gloucestershire.

p. 189. Out of a Stratum, made up chiefly of Ova of Fishes, and various Sea-Shells, lying 12 Foot deep. Sherborn, Gloucestershire.
CLASSIS XIII.

Fossilia incognita.

Most of the Bodies of this Class were collected when first I entered upon these Searches: and the following Description of them, drawn up when I was not much vers'd in these Studies. Since that, Observations that I have made on other like Bodies, that I have found, have convinc'd me that several of these belong to the vegetable Kingdom. Those Observations are set forth in the Descriptions of the Bodies in the Catalogue of the additional extraneous English Fossils. No. b. 24. &c. seq.

q. 1. A Stone of a very dark brown Colour, 6 Foot 9 in length, of a roundish Figure, but somewhat flat, being 4 Inches in breadth, and 2 in Perpendicular. It is not straight, but undulated or flexuous, and with large Flexus, there being but one entire and part of another in this whole Length. It rises into Tubercles over the greatest part of its Surface. 'Tis broken into 10 pieces, and was originally longer, the rest being not to be got out of the Stone of the Stratum in which it lay. There are also two pieces more, but flatter and broader than these: and likewise two pieces of that Stone in which this Body lay. From a Quarry at Haigh, Lancashire.

q. 2. A Cylindric Body three Inches in length: and half as much in Diameter. 'Tis of a ferruginous Colour, striated longways, and surrounded with six circular Sulci, placed at near equal Distances from each other. Found loose on St. Vincent's Rock near Bristol.

q. 3. Another Body, of like figure, but thicker: and composed of a brassy shining Pyrites. From the Canal Coal-pits at Haigh, Lancashire.

q. 4. Another Pyrites, not so thick, nor so round, appearing as somewhat compresse'd. Out of the same Coal-pits.

q. 5. A long body round and striated. This is made up of a pale brown gritty Stone with very small Sparks of Micae amongst it. From a Stone-pit, near Haigh, Lancashire.

q. 6. Another of a darker brown Colour and a more flat or compresse'd Figure. From another Stone-pit, near Haigh. There appear on several parts of the Surface of this, and the two following, Flakes of a Matter that is black, glossy, and much resembling Pitch; but they are only Remains of a Skin or Cortex with which these
these Bodies have been apparently entirely invesed, tho' now broken and shook off.

q. 7, 8. Two pieces of another of the same sort and from the same Pit.

q. 9. Another less, but rounder. From another Pit near the same Town.

q. 9* A Segment of a Body 7 Inches long and 3 in Diameter, a little flat and tapering, with Striae very thick, running parallel to the length of it, and 4 annular Striae surrounding it. These Annuli resemble Joints of the Stem of some Plant of the Canekind: and the Body appears like part of the Stem of some Plant, tho' it be composed of a coarse gritty brown Stone, with Mica in it, of the very same sort with the Stone of the Quarry in which it lay. Whitehaven, Cumberland.

q. 10, 11, 12. Three others, less, and flatter. From a Stone-pit, near Haigh, Lancashire.

q. 13. From the same Pit with q. 7, 8.

q. 14. Part of another, with a piece of the Stone in which it was lodg'd. From a Coal-pit near Haigh, Lancashire.

q. 14*. Another, found, in Shiver, lying over the Coal, at Lanelhey, Wales.

q. 14*. Another, less, but rounder. Out of a Quarry near Whitehaven, Cumberland.

q. 14*. Another, with part of the Stone in which 'twas lodg'd. Found near Whitehaven, in the same Quarry with q. 9*. supra.

q. 14†. Another, found in a Stratum of Stone of another Quarry near Whitehaven.

q. 14‡. Another. A Body in Figure approaching a Cylinder, only somewhat compress'd; being 1 Inch 3/4 Diameter one Way, and only 1 Inch the other. 'Tis striated lengthways, and surrounded with a Ring, crossing those Striae after the manner of a Joint. The Body was originally 2 Foot long: and had several like Joints, each about 2 Inches distant from other. Found in a Stratum of gritty Stone**, near Ashover in Scariscale, Derbyshire. 'Tis remarkable that several of the Bodies in this Class, tho' found in Places so distant from each other, are, besides their exterior Figure, composed of much the same sort of Matter; which is a brown gritty Stone, with small Spangles of a white flivery Talc in it.

q. 14 §. Found above the Coal in the Coal-pits of Houghton le Spring, in the Bishopprick of Durham.

q. 14*. Out of the same Coal-pit.

q. 14*. Out of still the same Coal-Pit.

q. 15. A grey Stone, flat; sulcated with parallel Furrows long-ways of it. From a Quarry near Haigh, Lancashire.

** See a Sample of it in the Catalogue of Addit. English Fol. f. b, 2.
q. 16. Another, that was contiguous to the former; and tackles with it.

q. 16*. Another, the Surface not quite so plain, but somewhat rounded; with Remains of a black, shining, thin Cortex; with which the whole Surface, seems to have been cover'd. *Lanelthy-Coaleryes, Wales.*

q. 17. An Iron Stone; black, flat, and wrought over one Surface very finely, with a strange cancellated Work. *Mr. Chetwynd, Staffordshire.*

q. 17*. A pale brown Stone, with small Micas of Talc in it, and a cancellated Work upon it; not much different from that of the foregoing, q. 17. This was found in the side of a deep Way on Boulton-Moor, *Yorkshire.*

q. 18. A Piece of grey Stone, having somewhat like a Cancellated, or Net-work upon it; but smaller and finer. From a Quarry in *Haigh, Lancashire.*

q. 19. Another with like Work upon it. This was Part of the former, till broke off from it.

q. 20. A Piece of grey Stone, with a black Film upon it, pretty thick set with small Stubs, rank'd in a kind of Quincunx Order; and two larger, appearing in manner of Breasts, each having a Cavity in the middle of it. From the same Quarry with the foregoing.

q. 21. A Piece struck off the former, bearing the Impressions of it, and tallying with it.

q. 22. Another Piece, the Surface rising into Rhomboid Stubs, placed in a Quincunx Order. From a Stone-pit, near the former. I have seen Fruits of the Fir-kind, from our West-India Plantations, that this Body nearly resembles.

q. 23. A Piece struck off the precedent, and tallying with it.

q. 24. A black Flint, cover'd with a thin grey Crust. 'Tis broken, and within there appear several oblong Protuberances, standing pretty regularly in a Quincunx Order: There are 7 or 8 of them in a Line, and 8 or 9 Lines. They stand all upon the same Plane, which rises and swells up a little in the Middle, and seems to extend further into the Body of the Flint. The Protuberances, are grey; the Plane, or Ground on which they stand, whitish: They are near as big as a Grain of Barley; and those of the same Row are placed at about 1/2 of an Inch distant from one another. There seems to have been some extraneous Body inclosed in the Flint to which this Signature is probably owing; but what that is, whether the Skin of some Fish, or what else, I have not yet been able to discover. 'Twas found in the Road betwixt *Greenhithe* and *Northfleet*, *Kent.* The Stubs appear manifestly to have been broken; and those of one Plate tally, and have been continuous with those of the other.

q. 25. A Piece of Chalk, having one Surface flat, of a brown Colour, with small Cavities ranked in near a Quincunx Order.
upon it: In the midst of each Cavity is a Tubercle, or Stud.

q. 26. Another from the same Place. Part of the Surface of this rises into smaller Studs, and is without any Cavities.

q. 27, 28. A Piece of Chalk, split in two. The Surface of one riling into large round Tubercles, standing close to one another; and that of the other, having Cavities answering them. From Northfleet in Kent.

q. 29. A brown Stone, having in it many Silvery Mica, or Talky Sparks. On one Surface of it are Cavities, placed in a Quincunx Order; in each whereof, stands a Papilla, with a small Cavity in the middle of it. Found on the side of a Hill near the River, by Sherborn, Gloucestershire. See what I have noted concerning the Origin of these Bodies [q. 29, 30, 30*] in the Catalogue of the additional extraneous English Fossils, No b. 31.

q. 30. Another, with like Cavities and Papillae upon it. Enfum, Oxfordshire.

q. 30*. Another, found in a Gravel-pit near Cambridge.

q. 31. A grey Spar, with shallow round Cavities on one Surface of it. Part of the Intervals are plain; the rest wrought, with a kind of Net-work. From the great Limestone-pit, near Dudley, Staffordshire.

q. 32. A Quincunx, or Reticulum, on a grey Stone. Found in the Highway, near Haigh, Lancashire.

q. 33. Found together with the former.

q. 34. A Fasciculus of Bodies, round, about of an Inch in Diameter, hollow, and parted into numerous Cells by means of Diaphragms, thick set throughout the whole Length of the Body. Some of these Bodies are sub-divided, or branched. As I remember, the Twigs of the Walnut-Tree are of this very Constitution. This was found in a Gravel-pit near Farringdon in Berkshire, and given me by Mr. Stonestreet; who says, 'tis the same with that which Mr. Lhwyd calls Alcyonium Fossilis pertusum rubiginosum. Lythophyl. p. 6. No 99.

q. 34*. Another like Body. Witney, Oxfordshire.

q. 35. A Piece of Stone, Part of a dark ferruginous Colour, appearing to hold Iron: the rest of a dark grey. This last is composed of Flakes, that part from each other without much difficulty, and are placed edgewise, and parallel to each other: They are thick set with undulated Lines running a-crofs them on both sides each Flake. The Body appears to have been a Nodule, and the Iron-Stone to have been the Center; the Flakes arising from it, and rendering all round to the Surface, which is of a dusky yellow Colour. Found in a Brook, near the River Duglas, in Lancashire.

CLASSIS XIV.

Cochlea Terrestres ex Telluris Visceribus erutæ.

[A] r. i. Two Snail-Shells, found, amongst several others, in grey Marl, about 10 Foot deep, in a Field near the Church, at Northleach, Gloucestershire. They are of that sort that Dr. Lister exhibits, Hist. Conchyl. N° 54. and are found at this Day living in most Parts of England.

CLASSIS XV.

Musculi fluviatiles ex Telluris Visceribus erutæ.

There are frequently found a sort of Muscle in the Allum-Mines at Whitby in Yorkshire. Several of them are exhibited, N° f. 567, to f. 571. supra. They are very like one sort of the English River Muscles.

Of the Cochlea fasciata vivipara fluviatilis. Conf. N° p. 57. supra.

[A] f. 1. This is a common English Muscle; and is exhibited by Dr. Lister, Hist. Conchyl. L. 2. N° xi. under the Title of Musculus later maximus & tenuissimus a carneulo viridesceens fer palustris. "Twas dug up in a Marl-pit, at Hunton, in Kent, along with several Sea-shells, mention'd Philosop. Trans. N° 155. and sent me by Dr. Hailey. I wrote to him to know whether he was positive it was dug up there. And by Letter, January 20, 1704. he assures me it was dug up with the rest, upon his certain Knowledge.

APPENDIX.

Various Bodies, recent, and of modern Growth, serving to match and compare with, or some other way to explain and illustrate the Antediluvian; digg'd out of the Earth, and preserv'd in my Collections, chiefly of extraneous Fossils.

PREFACE.

From the Time that I began first to collect and make Observations upon the Shells, and other adventitious Bodies, that are digg'd up at Land, I took great pains carefully to compare them with those at this day produced at Sea: and to preserve all such of these latter, as match'd the Fossil ones. They are amongst the rest of my Collection of Sea-Shells, English and Foreign: and there are besides, in my Repository, various Jaws of Sharks, and other Sea-Fishes, having the Teeth in them, that exactly match these found in the Earth: and serve to demonstrate that these likewise are genuine, and the real Teeth of once living Fish.

In like manner there are, in my Collection of dry'd Plants, many that match those inclus'd in Stone; particularly of the most common, the Fern-kind; of which I dry'd and preferred many Samples collected about the End of May, the Time that the Deluge, coming...
coming on, put a stop to the Growth of the Vegetables then in being; some Remains of which we now find inclos'd in Stone. My Design was to shew the Agreement of the Vegetables growing in that Season, now, in our Times, with those so found lodg'd in the Earth; as to their Growth, Condition, Constitution, and all other Respects: and any one who shall, as I have done, make an accurate Collection of them, will find those and these perfectly alike, allowance being made for the Change that some of the Fossil, particularly the Leaves, have undergone, either during the Time that they were sustaine'd in the Water of the Deluge, or since they have been reposited, for so many thousands of Years, in the Earth. I am most inclinable to believe, that the greater of the Leaves underwent the Change, they now shew, in the Deluge; after the manner of some other Bodies, of which an account is given above, in the Preface to the Catalogue of the extraneous English Fossils: And this may serve to explain why the Leaves of the Fern-kind are, above all others, so frequent and obvious; some sorts of Leaves being, doubtless, more susceptible than others of such Alteration, whereby they were fortify'd and strengthen'd; without which, Bodies so tender, as Leaves of Plants are, would scarcely have endured and been preserved, through so many Ages, down to our Times.

As to the Bodies in this Appendix, they are only a few, of such as I judg'd proper to have at hand, and ready to shew to any one that might happen to have some Dissatisfaction, or Doubt, of the Reality of the like Bodies digg'd up at Land. Which indeed most of the Virtuosi had, when I first enter'd upon these Studies; till the Bodies in my Collection convinc'd them, by giving ocular Proof of their true Origin and Constitution, and demonstrating the Vanity of the late Speculations, and Notions, that these were not of Marine Extrav, but mere Stones, and Natives of the Earth.

**Appendix.**

The extraneous Fossils, Shells, and the rest, compar'd with those produced at this Day.

1, 2. Two Cones that grew, together, on the same Branch of the Pinus Sylv. Raij, or Scotch Fir, in Trinity-College Walks, in Cambridge. They were gather'd in the beginning of June 1697. They are of different Years: and exactly match those digg'd out of the Peat-Marshes, Cheshire. See the English Catalogue, b. 70,

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‡ The Deluge, which put an end to the Growth of these and all other Vegetables, came on near this Time, viz. towards the End of May. Nat. Hist. Earth. Part 3. Sect. II. Consect. 5.
1. The younger, being succulent and tender, is found in the
Marshes, commonly somewhat perish'd and decay'd; this here, be-
ing kept dry, is well prefer'd.

2-4. Two other like Cones, gather'd off the Tree in the Phy-
sick-Garden at Chelsea, 23 June 1711.

5. A Piece of Fir, with the Knots in a Quincunx Order. Pet-
worth, Sufsex. This Order is observ'd in many Plants, and parti-
cularly the Fossil. See The Catalogue of the additional, extraneous
English Fossils, b. 29. & seq.

6. Pinus domestica, vera, with the Knots in a Quincunx Order.

7. A Piece of Spray Wood, shrunk, and crack'd in the char-
ring, much in the manner of the Ludus Helmontij; and serving
to illustrate what is deliver'd concerning the Origin of the Cracks
in that Body, in the Catalogue of the English native Fossils, * d. 40.

8, 9. Common Brick, broken into two Pieces, discover'd, on
the one, part of the Leaf of the Filix féména vulg. On the o-
ther, the Impression of it, after the manner that the Leaves of
Fern, and other Plants, are found, in breaking some kinds of flaty
Stones. See the Catalogue of the English extraneous Fossils, Clas 1.
There might be much better Impressions of Leaves taken in fi-
ner Clay, to be afterwards bak'd: and better still in Plaister of
Paris.

10. A Branch of a Stellar Porus, of the same Species with that
dig'd up at Harborow, Leicestershire; in the Catalogue of the na-
tive English Fossils, e. 12.

11. A Coralline Astroites, resembling that Fossil Astroite, in the
Catalogue of the English native Fossils. e. 94. but having the stellar
Cavities, on the Surface, somewhat deeper. Drawn up out of
the Sea near . . . .

12. A Coralline Body, radiated, and stellated, the Stars pro-
minent, and rising into Points, or Apices, in manner of that
Fossil Coralloid Body in the Catalogue of the native English Fossils,
e. 84.

13. A white Coralline Body, with parallel stellar Pores running
through it. Found at Pyrton-Passage, on the Severn, and probably
was part of some Coral hung out of Ships with Ballast. Given
takes this to be the Millepora of Imperatus, but erroneously. It
may serve to confirm and illustrate what is deliver'd of the Fossil
Coralloid Astroite, Catalogue of the English native Fossils, Clas 5.
Part 5.

14. A Coralline Body, compos'd of a Fasciculus of Fistula, or Pipes,
in some Parts stellar, in others only striated. 'Tis of a Constitu-
tion nearly approaching that of Spar. From the Coasts of Bar-
badoes. This is the very same Species with that in the Catalogue of
the English native Fossils, e. 113. only the Pores of that are larger.

15, 16. Two Coralline Fungi; from the Shores of Guernfey.
They nearly resemble the Coralline Bodies found in the Chalk-pits:

17. An Retepora, S. Eschara Marina Fer. Imperati?
18. That call'd the Coffin-Bone, in the Hoof of a Horse. There is one of these Bones, digg'd up at Wirtemberg, in the Catalogue of the foreign extraneous Fossils, v. i.
19. Five Vertebres, of some kind of Fish, cohering, and join'd.
20. One single Vertebra, of some Fish, found on the Shores near Moncaster, Cumberland.
21. Another; found along with the former.
22. Another. 23, 24. Two others.
25. The boney Palate, of some sort of Fish, probably related to the Paffinaca Marina, of which there's an account given, by Dr. Sloane, Philos. Trans. No 232. p. 674. This Palate was found on the Shores of Barbadoes. It consists of numerous Parts, somewhat inflected, join'd to each other in manner of a Suture. 'Tis much worn in one place, by grinding of the Food, probably Shell-Fish, that the Creature eats. I have observ'd something of like sort, in boney Palates, found in the Chalk-pits of Kent and Surrey, describ'd in the Catalogue of the English extraneous Fossils, No 100. & seq. Dr. Sloane, there, mentions Parts of the Tongue of the Paffinaca Marina, digg'd up in Maryland. I have receiv'd several like Parts that were digg'd up, together with those, and are describ'd in the Catalogue of the extraneous foreign Fossils, u. 105 & 106. that, trusting too confidently to him, I took to be of the Paffinaca Marina. But, upon a Review, I now rather judge them to be Parts of a Palate, of the Kind of this here describ'd.
26. The under Jaw of the Drum-Fish; from Virginia. See Joffelyn's New-England Rarities, p. 25. The single Teeth of this Fish are sometimes found in Stone-pits, along with those of the Lupus Marinus; both pass'd under the Name of Bufonis, or Toad-Stones. See great Variety of these in the Catalogue of the extraneous English Fossils, Class 10.
27. This was sent me for the lower Jaw of the Lupus Piscis, or Sea-Wolf. Teeth of these sorts are common in the Quarries of Oxfordshire and Northamptonshire. See the just now cited Catalogue, Class 10.
28. Teeth, out of another like Jaw.
29. 30, 31, 32, 33, 34, 35, 36, 37. Several like Jaws, sent by Agost. Scilla. Some of them he has grav'd, Tab. 2. of his Letter circa i Corpi Marini, petrificati. 4°.
38, 39, 40. Sent by Agost. Scilla. The Teeth in these Jaws are not unlike those call'd by Mr. Lhwyd Pletronita, but are less.
41. Finnes Teeth, some like the Pletronita; others of the Wolf-Fish. Sent by Agost. Scilla.
42. Part of the Jaw of a young Shark, thick set with small Teeth. Taken on the Coasts, near Minehead, Somersetshire.
43. Part of the Jaw of a Shark, or Dog-Fish. Sent by Agost. Scilla.
44. Teeth of various Kinds of Sharks, or Dog-Fish. Sent by Agoşl. Scilla. See his Lettera circa i Corpi Marini, petreficati, Tab. 1, 3, 6, 7, 14, 28.

45. Other Teeth of Sharks, taken, I think, on the Coasts of England.

46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56. Part of a Jaw of the Pezze Vacci, and several separate Teeth; sent by Agoşl. Scilla. See his Lettera circa i Corpi Marini, petreficati. Tab. 1, 4, & 27.

57. An Echinus Ovarius, from Sea, very fair. There are of this sort digg'd up in England, in the Chalk-pits at Greenhithe, Purfleet, Croydon, and in the Quarries of Clifton, in Northamptonshire, and elsewhere. See The Catalogue of the English extraneous Fossils, b. 207, to 210. There are of the same digg'd up at Messina, Malta, and other Parts abroad. See The Catalogue of the extraneous foreign Fossils, 2. 65. & seq.

58. Another Species of Echinus Ovarius; found on the Isle of Sheppey, Kent.

59. Another, exhibiting the Teeth, very fair. This Kind is found on the Coasts of Jamaica, Barbadoes, and other Parts of the West-Indies.

60. Great Variety of the Teeth of the Echinus Ovarij; taken out of several of the Shells.

61. Aculei, or Spikes of the Echinus Ovarius; sent by Agoşl. Scilla. See his Lettera circa i Corpi Marini, petreficati, Tab. xxii. There are of this Sort found in the Chalk-pits in England. See the Catalogue of the English extraneous Fossils. b. 224.

62. Three short Spikes, of an Echinus Ovarius, found on the Shores of Barbadoes. There are of this Sort found commonly in the Chalk-pits and Quarries in England. See the Catalogue of the extraneous English Fossils. b. 217, 218, 223. & seq.

63. Another, larger, from Sea.

64. Another, out of the Sinus Persicus, or Red-Sea.

65. Another, near 4 Inches long, likewise from the Red-Sea.

66. An Echinus Spatagus. This Kind is found commonly on the Western Coasts of England, Wales, and the Isle of Man.

67. Another, younger, and less but of the same Species.

68. Another, of a different Species.

69. Another, very large, West-Indies. There is one of this Species, somewhat less, sent by Agoşl. Scilla. See his Book, Tab. 10. Fig. 3. and the Catalogue of the extraneous foreign Fossils, 2. 42.

70. Another Species, flat, and thin. It seems to be the same Species with that digg'd up at Maryland in the Catalogue of Foreign extraneous Fossils, 2. 57.

71. Two Opercula, commonly called Umbilici Marini. Sent by Agoşl. Scilla. He found of these, in the Earth, near the City of Milazza. See the Catalogue of the extraneous foreign Fossils, 2. 116. The Tops of these are hollow'd.

72. Two others, with the Tops convex. Sent likewise by Agoşl. Scilla.
73. Tubular Shells, of the *Vermiculi Marini*, of several Sizes: See, in the Catalogue of extraneous English Fossils, Clavis 1. Part 1. Sect. 1. several digg'd up at Land.

74. Six small *Dentalia*, of which two are striated, the rest plain. Sent from Sicily by Agost. Scilla. See his Book, Tab. 18, Fig. 6, 7, 8. There are several in the *English extraneous Catal. Clavis* 1. Part 11. Sect. 2. and amongst the *Hampshire Fossils*, N° 21.

75. The common *Nautilus*, or *Nautilus Gracorum*, figur'd by Dr. Linfer, Tab. 571. This is broke, so as to shew the inward Fabric of it, and the Partitions. 'Tis commonly digg'd up at Land. See the *Catalogue of the English extraneous Fossils*, d. 1. & seq.

76. *Nautilus, exigus*, albus, pellucidus, teres, Litf. Hist. Conchyl. Sect. 4. c. 1. N° 2. From Barbadoes. This is the only Sea-Shell, yet discover'd, of the *Ammonites* kind: and is commonly found on the Coast of *Jamaica*, and the *Bahamas*. There are some of this Genus, among the Fresh-Water Shells, figur'd by Dr. Linfer, Hist. Conchyl. Lib. 2. Sect. 3. But none of them are divided into Cells, by Diaphragms, which the greatest part of the Fossil are.

77. *Nautilus, vacuus, f. non tabulatus, striis tauricibus distinctus*. Linser Hist. Conchyl. L. 4. c. 2. There is a Species, not very unlike this, in the Catalogue of the extraneous English Fossils, d. 21, 22.


80. *Cochlea Clavicula producta*. Shores near Scarborough. There are in the Catalogue of the extraneous English Fossils, e. 75. four of this Species, digg'd up in a Marl-pit, near Wiggen, Lancashire.

81. The *Pecten maximus*, Linser Hist. Animal. Anglia, p. 184. or Scallop-Shell. This was sent by Agost. Scilla. If it be amongst the Things grav'd in his Book, it must be that Tab. 15. It appears recent, as if found on the Shores, and not as if digg'd up at Land; tho' he sent it with the Fossil Shells.

82. A Pair of Scallop's, English. 'Tis of the same Kind with those digg'd up in England, in the Catalogue of the English extraneous Fossils, f. 37. & seq. We have commonly of the same Kind, or very near, from Barbadoes.

83. A Scallop, exactly like that in the Catalogue of the English extraneous Fossils, f. 37 x. This was found on the Shores of England.

84. Another, English, of the same Kind with those in the Catalogue of the English extraneous Fossils, f. 90. & seq.

85. Tree-Oysters; from the Mangrove-Trees, on the Shores of Jamaica. There are found Shells, not unlike these, in the Quarries.
ties of Oxfordshire, Gloucestershire, and Northamptonshire. See the Catalogue of the extraneous English Fossils, f. 149. & seq.

86. Ostrea Arborea Marginibus dentatis. From the Shores of Barbadoes. There are digg’d up, in several Parts of England, Shells of this Kind, or nearly related to it. See the Catalogue of the extraneous English Fossils, f. 172. & seq.

87. One of the Leptopolyginglimi; from Barbadoes. There are of the same Species found on the Shores of England; and also digg’d up at Land. See the Catalogue of the extraneous English Fossils, f. 418. & seq.

88. Another of the Leptopolyginglimi; found on the Shores near Plymouth. This is exactly like that in the Catalogue of the extraneous English Fossils, f. 419.

89. Pelecunculus maximus, subsuscus, valde gravis. Listeri Hist. Conchyl. N° 108. Found near the Mouth of the River Tees, on the Shores of Yorkshire. This Species is commonly digg’d up at Richmond, in Surrey. See the Catalogue of the extraneous English Fossils, f. 433. & seq.

90. A Pair of Pelecunculi, from New-England; where they are called Clams. This Species, or one very like it, is digg’d up commonly in England. See the Catalogue of the English extraneous Fossils, f. 447. & seq.

91. A Pair, less, from Barbadoes.

92. A Pair of Pelecunculi fasciati; from Jamaica. I have seen of the same sort from Barbadoes; and there are of the very same digg’d up in England. See the Catalogue of the extraneous English Fossils, f. 480.

93. Another, less. Barbadoes. This is little, if at all, different from those in the Catalogue of the extraneous English Fossils, f. 482. & seq.


96. Another, less; from Barbadoes.

97. The common Cockle of Dr. Lister, Hist. Conchyl. N° 171. There are of this sort digg’d up in several Parts of England. See the Catalogue of the extraneous English Fossils, f. 562. & seq.


99. A Cuneus, from Barbadoes. This has a Hole bored through it by the Purpura. See the Preface to the Catalogue of the Hampshire Fossils; and the Catalogue of the foreign extraneous Fossils. S. 121.

100. Another, from Barbadoes. This Species is also found on the Coast of England; and likewise digg’d up at Land, in various Places. See the Catalogue of the extraneous English Fossils, f. 594. & seq.

101. Another, also from Barbadoes. This seems to be of the same Species with them digg’d up near Woolwich, in the Catalogue of the extraneous English Fossils, f. 587.
A Pair, English. There is, somewhere, in my English Collection of extraneous Fossils, a Shell of the same Kind.


Shells, found on the Shores near Minster, Sheppey-Island, worn, and plain'd, by the Agitation of the Sea by Tides and Winds. This may serve to illustrate what is set forth in the Catalogue of the extraneous English Fossils, Mantifla 3. Sect. 1.

An Oyster-Shell, with numerous Perforations made by Worms. Found on the Shores near---Suffex. This may serve to illustrate what is set forth in the Catalogue of the extraneous English Fossils, Mantifla 3. Sect. 2.

An Impression, in Sealing-Wax, of the Ammonita, in the Catalogue of the extraneous English Fossils, d. 99.

An Impression of a Concha Anomia fulcata, in the Catalogue of the extraneous English Fossils, f. 337d. taken off in Sealing-Wax.

An Impression of a Lapis Judaicus, or tumid Aculeus of an Echinus Ovarius, in a greyish Flint; in the Catalogue of the extraneous English Fossils, b. 250. Taken off in red Sealing-Wax.

An Impression of that in Flint. Ibid. b. 251.

Lead, cast in a turbinated Shell, I think, that of Dr. Liner, Hift. Animal. Angl. Tab. 3. Fig. 1. This, and the following were cast with design to shew the Manner of the Formation of the Cochilite, Conchite, &c. in the Shells at the Deluge.

Another like leaden Cast, I think, in the Shell, Fig. 2. Ibid. Another. 113. Another. 114. Another. 115. Another. 116. Another.

Lead, cast in the Pectunculus maximus, of the same Species with No 89. supra.

Lead, cast in an Echinus Spatagus, of the same Species with those in the Catalogue of the extraneous English Fossils, b. 9. & seq.

Lead, cast in an Echinus Galeatus, of the same Species with those in the Catalogue of the extraneous English Fossils, b. 62 & seq.