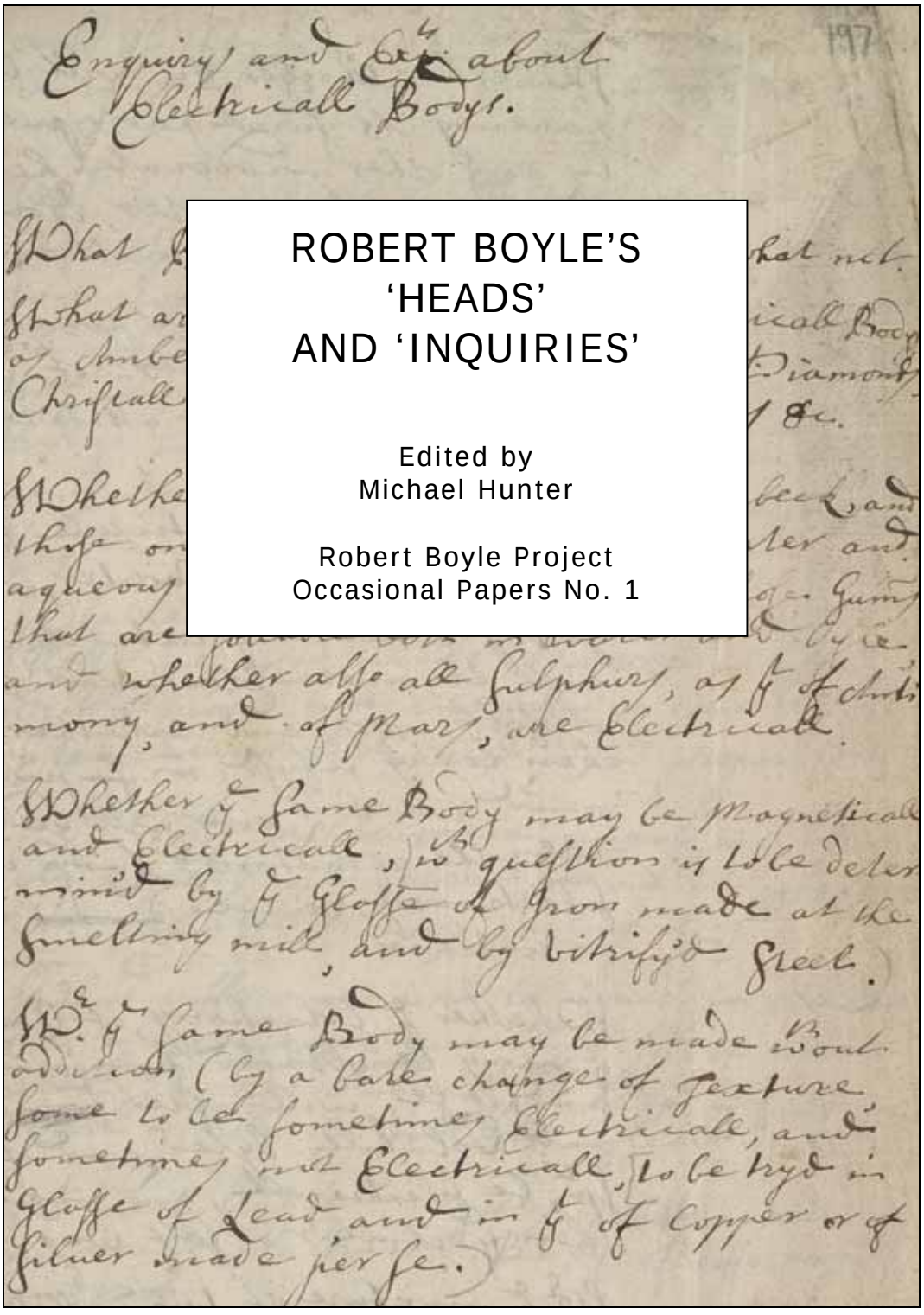


ROBERT BOYLE'S 'HEADS' AND 'INQUIRIES'

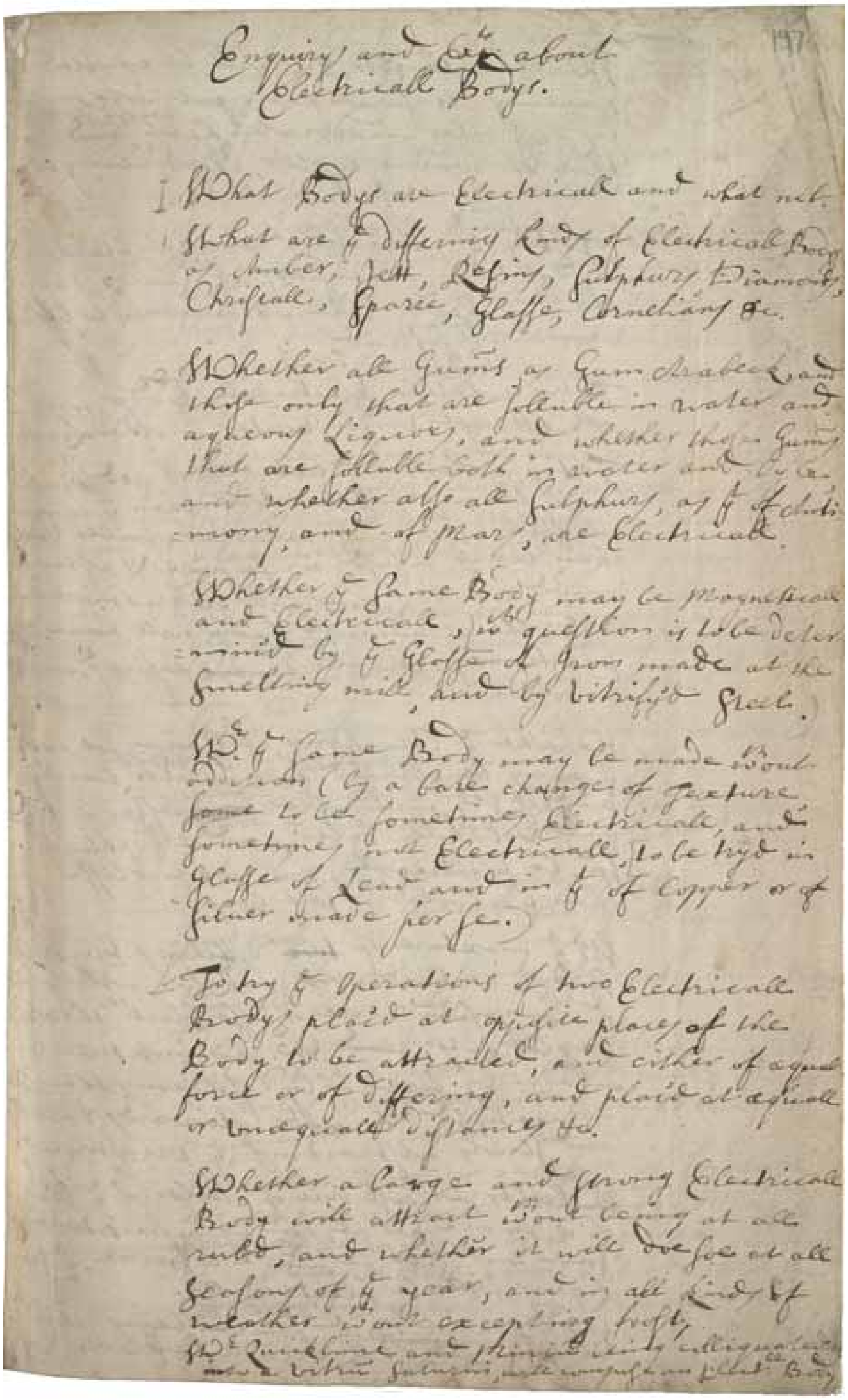
Edited by
Michael Hunter

Robert Boyle Project
Occasional Papers No. 1

Robert Boyle's
'Heads' and 'Inquiries'

This publication makes available hitherto unpublished material by Robert Boyle (1627–91) in the form of the sets of 'heads' and 'inquiries' that he devised, a key part of the inductive method that he developed on the basis of that of Francis Bacon (1561–1626). Following Bacon, Boyle used such lists as a means of setting himself an agenda when studying a subject, for organising data and for soliciting related information from others. The documents in question cover a fascinating range of topics, from luminosity and elasticity to anatomy and the incidence of disease. They throw important light on Boyle's scientific interests and method.

The editor, Michael Hunter, is Professor of History at Birkbeck, University of London, and Director of the Robert Boyle Project.


Enquirys and Exp^ts about
Electricall Bodys.

1 What Bodys are Electricall and what not.
What are y^e differing Kinds of Electricall Bodys of Amber, Jett, Rosins, Sulphurs, Diamonds, Christalls, Sparre, Glasse, Carnelians &c.

2 Whether all Gums as Gum Arabeck and those only that are solluble in water and aqueous Liquors, and whether those Gums that are solluble both in water and Oyle and whether also all Sulphurs, as y^t of Anti-mony, and of Mars, are Electricall.

Whether y^e same Body may be Magneticall and Electricall, w^ch question is to be deter-mind by y^e Glasse of Iron made at the Smelting mill, and by vitrifyd Steel.

Wh^r y^e same Body may be made w^out addition (by a bare change of texture) some to be sometimes Electricall, and sometimes not Electricall, to be tryd in Glasse of Lead and in y^t of Copper or of Silver made per se.

To try y^e Operations of two Electricall Bodys placd at opposite places of the Body to be attracted, and either of equall force or of differing, and placd at equall or unequall distances &c.

Whether a Large and strong Electricall Body will attract w^out being at all rubbd, and whether it will doe so at all Seasons of y^e year, and in all Kinds of weather w^out excepting frosty.
Wh^r Quicklime and [illegible]

The first page of Boyle’s ‘Enquirys and Experiments about Electricall Bodies’, Royal Society Boyle Papers 22, p. 197. A typical set of inquiries in hand F, dating from the 1660s. (Dimensions of original: 295 x 180mm).

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2005

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The illustration is reproduced from Boyle Papers 22, p. 197, by kind permission of the President and Council of the Royal Society

Contents

Introduction

This is an edition of a distinctive group of documents surviving among the Boyle Papers at the Royal Society, with ancillary items from other repositories, notably the Locke Papers in the Bodleian Library. These exemplify a method for collecting and organising data which Robert Boyle adopted from the 1660s onwards. Further examples of the genre are to be found in Boyle's published writings, both the influential sets of 'Heads' and 'Inquiries' that he produced for *Philosophical Transactions* in the 1660s, and the lists of 'Titles' that he deployed to structure a number of his major works, from *New Experiments and Observations touching Cold* in 1665 to the posthumous *General History of the Air* of 1692.[1]

As has been argued more fully elsewhere, this was a genre that Boyle derived from Francis Bacon, and his new-found enthusiasm for it in the 1660s seems to have been due to the influence of the Royal Society in its early years.[2] There is a striking absence of evidence of Boyle's use of such 'heads' in his earlier writings, which are more discursive in structure. The significance of the 1660s as the time when he adopted the genre is underlined by various pieces of evidence. It was now that he published such lists to a disproportionate extent, especially the *Philosophical Transactions* items already referred to. Even some of those published at a later date seem to trace their origins to this decade. In addition, the hitherto unpublished documents presented here survive in handwritings of the 1660s to a disproportionate extent: 1660s material is relatively rare in the Boyle archive as a whole, yet, of the documents of this type surviving in the archive, thirteen out of seventeen are in 1660s hands. What is more, these frequently show evidence of revision during composition, thus confirming that they were newly compiled at that time.

Of course, not all are of this date: a number are in later hands (though, strikingly, none is in an earlier one). It is clear that, just as Boyle continued to use such lists as the structure for published works for the rest of his life, so he seems to have continued to have had such lists compiled or recopied in manuscript. It is unfortunately often impossible to tell whether documents in later hands are copies of ones originally compiled earlier, or whether they originated at the time when they were written. In at least one case (doc. j, pp. 17–19) there is evidence of later composition or revision, but in others recopying seems likelier. It is perhaps worth noting that, to a disproportionate extent, it is the documents in later hands that have the most explicitly Baconian titles (see docs j, k and r, pp. 17, 19, 33), echoing the revived interest in the genre which Boyle appears to have taken in connection with the preparation of *Human Blood* for publication in the early 1680s.[3]

The documents give an extraordinary insight into Boyle's intellectual agenda, and the way in which this was informed by his curiosity and his philosophical acumen. They are extremely rich and vivid in terms of the information that they give about phenomena which interested Boyle and the ways in which he suggested that these

[1] See esp. *Works*, vol. 4, pp. 226–7; vol. 5, pp. 508–11, 527–40 and 544–6; vol. 10, pp. 12–16, 220–4 247–9; vol. 12, pp. 7–8.

[2] See Michael Hunter, 'Robert Boyle and the Early Royal Society: a Reciprocal Exchange in the Making of Baconian Science', *British Journal for the History of Science*, forthcoming.

[3] See Harriet Knight and Michael Hunter, 'Robert Boyle's *Memoirs for the Natural History of Human Blood* (1684): Print, Manuscript and the Impact of Baconianism in Seventeenth-century Medical Science', *Medical History,* forthcoming.

might be investigated. They range from the theory of matter and the investigation of topics like elasticity or luminosity to anatomy and the incidence of disease. As already noted, they reflect Boyle's intellectual inheritance from Francis Bacon, who had seen the preparation of 'Particular Topics or Articles of Inquiry' as central to the enterprise of natural philosophy. In Boyle's case, such lists of 'Heads' or 'Titles' might be used either as a framework for organising data, as in such published works as his *Cold* (1665) or his *General History of the Air* (1692),[4] or as an agenda for collecting information, as in his 'General Heads for a *Natural History* of a *Country,* Great or small' or his 'Articles of Inquiries touching *Mines*', both published in *Philosophical Transactions* in 1666.[5] As represented here, the genre is disproportionately aimed at eliciting data through experimental inquiry.

The documents contained in this volume vary markedly both in their range and in the amount of detail they give. Some are hardly more than lists. Others are much more discursive and elaborate. And, whereas some deal with quite a specific set of phenomena, others range more widely, perhaps particularly the one dealing with the 'Natural History of the Sea' in all its aspects. It is also worth commenting on the way in which the 'Heads' are presented. Sometimes entries begin 'Of', as if they are going to be descriptive, sometimes 'Whether', as if they are interrogatory. This reflects the ambivalence between 'Heads' and 'Inquiries' in the title of the genre which Boyle inherited from Bacon, and, to an extent which we may find slightly strange, both men seem to have seen the two as interchangeable.

Though those who study the documents presented here and compare them with the published examples already itemised will have no doubt about the distinctive character of the genre and its direct links with the Baconian precedents to which Boyle explicitly declared himself indebted, it has some slightly grey edges. Firstly, there are summaries of the content of proposed books which sometimes seem superficially similar, in that they often set out a series of statements, sometimes accompanied by a list of instances: these go back to much earlier in Boyle's career and continue thereafter. Early examples include 'Of Publick-spiritednesse' from the 1640s or 'Of Natural Philosophie' of c. 1650, while from the 1660s we have the plans for the unpublished parts of *The Usefulness of Natural Philosophy*, or for the attack on orthodox medical practice that Boyle drew up at that time, or the synopsis on the complementary nature of reason and revelation that has recently been published in full by Jack MacIntosh.[6] The difference between the two genres is signalled by the fact that such documents usually comprise a set of propositions introduced by 'That', in contrast to the more interrogatory 'Whether' or descriptive 'Of' which characterises the documents presented here. There is also an element of overlap between the documents printed below and more basic lists of experiments or of things to remember that Boyle compiled, which often give a list of phenomena, each preceded by 'Remember'.[7] Both types of document are fascinating and richly deserving of study, but they are essentially separate from the 'Heads' and 'Inquiries' dealt with here. This edition also excludes examples of the genre that were published in or shortly after Boyle's lifetime, either in

[4] *Works*, vol. 4, esp. pp. 226–7, vol. 12, esp. pp. 7–8.
[5] Ibid., vol. 5, pp. 508–11, 529–40.
[6] See *Works*, vol. 1, p. cxii; *Scrupulosity and Science*, pp. 30–1; *Works*, vol. 13, pp. lxiii–lxx; *Scrupulosity and Science*, pp. 167, 187–9; J.J. MacIntosh, *Boyle on Atheism* (Toronto, 2006), sect. 4.6.8, from BP 3, fols 115–20. For other examples, see the texts relating to pores and corpuscles in BP 8, fol. 46v, and BP 10, fols 87–8; the synopsis, 'Of Fermentation', in BP 28, pp. 403–4; and the 'Scheme of the Notes about Sensation in generall', of which overlapping texts survive in BP 10, fol. 48, and BP 41, fol. 51.
[7] For an example, see *Scrupulosity and Science*, p. 229. See also, e.g., BP 10, fols 74, 102, 112; BP 36, fols 52–3, 81–2.

Philosophical Transactions or in his own books; extant manuscript material linked to these published texts is also excluded, since it is tabulated in full in *The Works of Robert Boyle.*[8]

Lastly, by definition only texts which are extant can be included, whereas it is clear from the inventories of Boyle's papers made by Henry Miles c. 1740 that further specimens passed through his hands which are no longer extant. These include 'Titles' for the natural history of common salt, for example, or 'Heads' for the natural history of gold or of the tides, none of which is otherwise known.[9] Interestingly, in a list that Henry Oldenburg compiled of Boyle's unpublished writings in 1677, he included 'A Book of Schemes and Queries relating to Natural philosophy', 'In a Marble-paper Cover'.[10] This is no longer extant in that form, but it may be argued that the present volume goes as far as is possible to reconstruct an otherwise lost work by Boyle.

The texts are presented in the order in which they appear in the Boyle Papers (or, in cases where multiple versions survive, at the point where the copy text appears), with documents from other sources at the end. In the brief introduction to each document which follows, a standard format has been deployed: the title is followed by information on the source, on handwriting and date, and on the physical characteristics of the document. There is then a more discursive note on the document, including information on previous publication where appropriate.

a. 'Experiments about Volatile Salts', pp. 1–2

BP 10, fol. 5. Hand: Slare. Date: c. 1670. Written on the recto of a single leaf; verso blank. Throughout, where 'V.S.' is used, it has been silently expanded.

There are no clear clues to the date of this text, other than from handwriting. Though it bears a general relationship to the *Producibleness of Chymical Principles* of 1680, Boyle specifically refers to a lost paper on the history of volatile salts in *Human Blood.*[11]

b. 'Magneticall Tryalls (made & to be made)', pp. 2–3

BP 10, fol. 57. Hand G. Date: 1660s. Written on the recto of a single leaf; verso blank. Endorsed opposite the first line of text: 'Tbd'.

This fairly spare document sets out an agenda for experiment on magnetical phenomena of the kind which Boyle was to implement both in his workdiaries and in such published works as chapter 1 of *Experimenta et Observationes Physicae* (1691).[12]

[8] See esp. *Works,* vol. 5, pp. xxxv–vi, 529–40, 544–6; vol. 10, pp. xi–xv (see also Michael Hunter and Harriet Knight (eds.), *Unpublished Material relating to Robert Boyle's 'Memoirs for the Natural History of Human Blood'*, Robert Boyle Project Occasional Papers, No. 2, 2005); vol. 12, pp. xi–iii, xv–xviii, xxiii–iv.

[9] See Michael Hunter and Lawrence M. Principe, ''The Lost Papers of Robert Boyle', *Annals of Science*, 60 (2003), 269–311, on pp. 299 (nos. 23, 35), 300 (no. 46), 303 (no. 91), 304 (nos. 115, 127), and 308 (no. 203). All these are in Miles' list of 'Titles'.

[10] *Works*, vol. 14, p. 338.

[11] *Works*, vol. 10, p. 39.

[12] *Works*, vol. 11, pp. 377–84. For the workdiaries, see www.livesandletters.ac.uk/wd.

c. 'Experiments to be made in seald Receivers', pp. 3–4

BP 10, fol. 118. Hand E. Date: 1660s. Written in two columns on the recto of a single leaf; title written across entire page; verso blank. The letters given in square brackets at the end of entries are pencil endorsements entered in the margin. Most entries are crossed through piecemeal in pencil; those that are not are marked *.

This is another fairly straightforward list which includes various experiments published by Boyle, including ones in 'Light and Air' (*Phil. Trans.*, 1668), 'Respiration' (*Phil. Trans.*, 1670), 'Of the Difficulty of Producing Flame without Air' and 'Of the Difficulty of Preserving Flame without Air' (*Flame and Air*).[13] It may be referred to by Oldenburg in a letter to Boyle of 3 December 1667.[14]

d. Untitled heads on elasticity, pp. 4–6

BP 10, fol. 132. Hand F. Date: 1660s. Written on both sides of a single leaf.

Boyle refers to a treatise on the mechanical explanation of elasticity in *Spring of the Air* (1660), in *Defence* (1662) and in *First Continuation* (1669), where it is described as 'Notes about the history of Elasticity'.[15] These heads evidently relate to this otherwise lost work.

e. Heads concerning Tastes, pp. 6–7

BP 10, fols 133v–4. Hand F. Date: 1660s. The title is written across a double-page spread, with the text beginning on the lefthand opening and continuing on the right. The recto of the first leaf and the verso of the second is blank.

This and the next item, which survives adjacent to it, may be examples of the 'speculations' that Boyle disavowed in favour of 'matters of fact' at the start of 'Mechanical Production of Tastes' in *Mechanical Qualities* (1675–6).[16] The document lays out a full agenda for work in the field.

f. Heads concerning Odours, pp. 7–9

BP 10, fols 135v–6. Hand F. Date: 1660s. The title is written across a double-page spread, with the text beginning on the lefthand opening and continuing on the right. The recto of the first leaf and the verso of the second is blank.

See previous note. This document also lays out a full agenda for work in the field. Note the 'Desiderata in the History of Odors' at the end.

[13] See *Works*, vol. 6, pp. 11–13, 251–4; vol. 7, pp. 87, 97.
[14] *Correspondence*, vol. 3, p. 373.
[15] *Works*, vol. 1, p. 166, vol. 3, pp. 117, 123 and vol. 6, p. 77.
[16] *Works*, vol. 8, pp. xxix, 365.

g. 'Anatomical Experiments to be try'd', pp. 9–12

BP 18, fols 129–30. Hand F. Date: 1660s. Written on two (now) separate leaves, which were perhaps once conjugate. The final three paragraphs are written in the margin at right-angles to the main text

This important document lays out an agenda for dissection experiments, discovering what treatment would stimulate convulsions and other effects. Some of its prescriptions are quite elaborate. It is clearly linked to the work of the Oxford group, though the actual experiments involved are not otherwise documented.[17] The final sentence should be noted.

h. 'Enquirys and Experiments about Electricall Bodys', pp. 12–15

BP 22, pp. 197–200, and BP 38, fol. 120. Hand F. Date: 1660s. Written on all four sides of a conjugate pair of leaves, and continuing on a single leaf, ending part of the way down the verso. The first two item are numbered '1' and '2', but this is not sustained and has therefore been ignored here.

This is clearly linked to Boyle's 'Mechanical Origin of Electricity' in his *Mechanical Qualities* (1675–6); in addition, 'my Notes about Electricity' are referred to in *First Continuation*.[18] The first section only was printed in M.B. Hall, *Robert Boyle on Natural Philosophy* (Bloomington, 1965), pp. 252-5.

i. 'Concerning shining Wood', pp. 16–17

BP 25, pp. 392–3. Hand E, changing to hand F at p. 393 (also making an addition on p. 392). Date: 1660s. Written across a double page spread, with the recto of the first leaf and the verso of the second blank. In two columns, with that under 'Observations to be made' blank except for the keyed addition to the main text. Entry numbers subsequently added in pencil, in an order differing from that in which the entries were written. The entries have been reordered to reflect the numeration: entries nos. 10 and 11 originally appeared after the unnumbered entry between 3 and 4, with 11 preceding 10, and 12–14 between 17 and 18; the unnumbered, deleted entry between 12 and 13 has been moved with the group of which it forms part.

This document is evidently that referred to by Boyle in 'Light and Air' (*Phil. Trans.*, 1668) as a place where he had proposed various trials of this kind, one of which he there exemplified.[19] This item (which spawned a series of ancillary experiments) was therefore deleted from the list while the rest remained and were renumbered as described above. Oldenburg had referred to Boyle's 'Queries' on the subject in various letters in December 1667.[20]

[17] For background, see Robert G. Frank Jr., *Harvey and the Oxford Physiologists: Scientific Ideas and Social Interaction* (Berkeley and Los Angeles, 1980).
[18] *Works*, vol. 6, p. 172. Cf. ibid., p. 175 ('My Observations about Electricity'); see also *Effluviums*, ibid., vol. 7, p. 262.
[19] Ibid., vol. 6, pp. 3–25, esp. p. 5
[20] *Correspondence*, vol. 3, p. 373. Cf. ibid., pp. 376, 380.

j. 'Titles or Topica Particularia about the Natural History of Water', pp. 17–19

BP 26, fols 49–50. Hand: Bacon. Date: 1670s–80s. This is a conjugate pair of leaves, with the verso of the first and the recto of the second blank, probably because it has been bound into the volume the wrong way round: i.e., fol. 50v precedes fol. 49r. A further, slightly different version survives in BP 25, pp. 264–5, and the differences between the two have been noted in footnotes. Hand: Bacon. Date: 1670s–80s.

This is a very general synopsis. No obvious context is apparent either from Boyle's published works or his papers. The differences between the two versions suggest that Boyle continued to work on it at this time.

k. 'Titles and Articles of Inquiry in Order to A Natural History of the Sea', pp. 19–23

BP 26, fols 51v–2: Hand: Bacon. Date: 1670s–80s. Written across a double page spread, with the recto of the first leaf and the verso of the second blank. The numbers are written in ink and are integral to this copy. Various commas were added in darker ink.

Boyle supplied 'Other Inquiries concerning the Sea' for *Philosophical Transactions* in 1666, in connection with which Oldenburg noted that Boyle 'had not left unconsidered the Natural History of the *Sea*', possibly referring to an earlier version of the agenda represented here.[21]

l. Untitled heads concerning light and luminosity, pp. 23–4

BP 26, fols 62. Hand: Bacon. Other copies survive in BP 26, fol. 70, and BP 36. fols 98 and 99 (two copies). All copies are on rectos only with verso blank. All are in Bacon's hand. Trivial differences of orthography, etc, between the different versions have been ignored.

In contrast to 'Shining Wood' (above), this document represents a more general agenda concerning light and luminosity.

m. 'Enquirys about Lime', pp. 24–6

BP 26, fols 75–6. Hand F. Date: 1660s. Written on a conjugate pair of leaves. Verso of second leaf blank.

This is another example of a rich research agenda for which there is no obvious context in Boyle's extant remains.

[21] *Works*, vol. 5, p. 527.

n. 'Enquirys & Tryalls about Insects & Spontearta', pp. 26–7

BP 26, fol. 90. Hand F. Date: 1660s. Written on both sides of a single sheet.

This item is referred to in a letter from Oldenburg to Boyle dated 24 February 1666.[22] It clearly relates to Boyle's concern with spontaneous generation, as recently studied by Peter Anstey.[23]

o. 'Queries about Gems', pp. 28–30

BP 27, pp. 331–2. Hand: Oldenburg. Date: 1660s–70s. The text appears on pp. 331–2; pp. 333–4 is a conjugate leaf, but is blank except for Wotton's endorsement on p. 334: 'Queries concerning Gems drawn by Mr Boyle. writt in Mr Oldenburghs Hand'.

In general terms, this obviously relates to *Gems* (1673). It offers a very detailed set of inquiries, ranging beyond that work, though it is possible that it may relate to the various lost writings on related topics to which Boyle refers in *Gems*.[24] The fact that it is in Oldenburg's hand means that it must date from before 1677, but the date of the original from which it is derived is unclear.

p. Untitled heads concerning copper, pp. 30–1

BP 36, fol. 80. Hand: Bacon. Date: 1670s–80s. Written on a single leaf; verso blank. 'C' expanded to 'Copper' throughout.

This is perhaps to be compared with the work on tin published in vol. 14 of the *Works*.[25] There are many references to copper scattered through Boyle's writings.

q. Inquiries concerning Valentine Greatrakes, pp. 31–2

BL 3, fols 33–4. Hand F. Date: 1666. Written on a conjugate pair of leaves, of which the final verso is blank except for the endorsements, the first two in Boyle's hand: 'Enquirys about the Stroker', 'Enquirys about Mr Greatraks' and 'papers of Mr Boyle one about Greatrix' (in pencil).

In this document, Boyle applies his method to a specific case, that of the Irish healer, Valentine Greatrakes. The queries were probably written at an early stage in Boyle's interest in the affair. His own investigations of Greatrakes' healing powers are recorded in a workdiary and other sources.[26] The inquiries were previously published in R.E.W. Maddison, *The Life of the Hon. Robert Boyle* (London, 1969), pp. 124–6, and in C.S. Breathnach, 'Robert Boyle's Approach to the Ministrations of Valentine Greatrakes',

[22] *Correspondence*, vol. 3, p. 80.
[23] Peter Anstey, 'Boyle on Seminal Principles', *Studies in History and Philosophy of Biological and Biomedical Sciences*, 33 (2002), 597–630, esp. pp. 614–19.
[24] *Works*, vol. 7, pp. 3–72, passim.
[25] Ibid., vol. 14, pp. 133–43.
[26] See Workdiary 26 at www.livesandletters.ac.uk/wd; *A Brief Account of Mr Valentine Greatraks* (London, 1666), pp. 43ff.; and *Correspondence*, vol. 3, pp. 93–107, 160–1; vol. 4, pp. 98–103

History of Psychiatry, 10 (1999), 87–109, on pp. 97–101 (with a facsimile of the manuscript).

r. 'Præliminary Topicks or Articles of Inquiry, in order to The History of Diseases', pp. 33–34

British Library Sloane MS 2502, fols 1v–2. Hand: Bacon. Date: 1670s–80s. Written on a double-page spread, the accompanying recto and verso of which are blank. The numeration and all the square brackets except the opening brackets under nos. 1 and 2 are added in pencil. This is clearly Boyle's own copy: it presumably reached its present location through Birch. There is a copy by Locke in Bodleian Library MS Locke c. 42 (part 1), p. 98, headed '82' and 'Morbus': Locke's copy lacks the numeration and the square brackets, except the opening ones to entries 1 and 2. Its capitalisation and punctuation display minor differences which have not been noted here.

This is an otherwise unknown reflection of Boyle's medical interests. It clearly relates to the interest in the relationship between disease and mineral deposits and airborne particles discussed in Boyle's 'Salubrity of the Air', appended to *Languid Motion* (1685), and other works. The text is printed in Patrick Romanell, *John Locke and Medicine: A New Key to Locke* (New York, 1984), pp. 102–3, where it is wrongly presumed to be by Locke. The inclusion of descriptive matter at the end of each entry, here enclosed in square brackets in pencil, parallels Boyle's practice in some of his book synopses (see above, n. 6).

s. Untitled heads concerning flame and fire, pp. 34–6

Bodleian Library MS Locke c. 42 (part 1), fols 266–7. Hand: Brownover. Date: 1682 [i.e., for Locke's copy]. Endorsed by Locke at head: '82' and 'Flamma'; also endorsed 'Flamma' at the head of p. 267 and 'Mr. Boyle' at end of the last entry in Locke's hand. The numbering was added in pencil subsequent to the original transcription of the manuscript. It should be noted that Brownover evidently twice initially mistakenly transcribed the abbreviated form of 'Whether' as 'What', after which he gives it in unexpanded form from no. 36 onwards. Here, all instances of this have been expanded as 'Whether'.

This is evidently linked to a lost work by Boyle: extant fragments from a dialogue on this topic dating from the 1650s are printed in *Works*, vol. 13, where the relationship between this and later writings by Boyle on related topics is discussed.[27]

t. 'Queries about Damps', 36-7

From Oldenburg to Lister, 11 September 1675, Bodleian Library MS Lister 34, fol. 35. The letter as a whole is printed in *Oldenburg*, vol. 11, p. 489–91. A draft version, also in Oldenburg's hand, survives in Early Letters H.3.36. Verbal

[27] See *Works*, vol. 13, pp. xliv–vi, 259–69, esp. p. xlv.

differences between the two versions are noted here, but minor differences of spelling and punctuation have been ignored.

For the genesis of these queries, which were compiled by Boyle in conjunction with Oldenburg after being requested by Lister on behalf of the virtuoso, Francis Jessop, in a letter dated 28 July, see ibid., pp. 433, 488–9 (details of the related letter in EL H.3.36 are given in ibid., p. 489). They are clearly linked to the 'Articles of Inquiries touching *Mines*' published in *Phil. Trans.* in 1666 (see above, n. 1), but they were independently compiled at a later date. Boyle discusses the issue of damps in mines at various points in his writings.

Acknowledgments

The following have assisted in the preparation of this edition. I am indebted to Lawrence Principe for drawing my attention to the text of Boyle's 'Topics for the History of Diseases' in Sloane MS 2502 and that of the heads concerning heat and flame in MS Locke c. 42, and to Peter Anstey for drawing my attention to the 'Queries about Damps' in MS Lister 34. Sue Rodmell kindly transcribed many of the manuscripts. Charles Littleton and Harriet Knight assisted with various points. I am also indebted to the library staff at the Royal Society for their help.

Abbreviations

BP	Boyle Papers
BL	Boyle Letters
Correspondence	Michael Hunter, Antonio Clericuzio and Lawrence M. Principe (eds.), *The Correspondence of Robert Boyle*, 6 vols. (London, 2001)
Oldenburg	A.R. and M.B.Hall (eds.), *The Correspondence of Henry Oldenburg*, 13 vols. (Madison and London, 1965–86)
Phil. Trans.	*Philosophical Transactions*
Scrupulosity and Science	Michael Hunter, *Robert Boyle (1627–91): Scrupulosity and Science* (Woodbridge, 2000)
Works	Michael Hunter and Edward B. Davis (eds.), *The Works of Robert Boyle*, 14 vols. (London, 1999–2000)

Textual note

The documents have been transcribed according to the principles for transcribing manuscript texts deployed in the *Correspondence* and *Works* of Boyle. Briefly, original spelling, capitalisation and punctuation are retained; standard contractions (e.g. the thorn with superscript 'e' for 'the') have been silently expanded. Underlining in the original has been shown by the use of italic. Original foliation has been indicated by the insertion in the text of 'fol. 132' or 'fol. 132v' within soliduses where each recto or verso of the manuscript text begins (or, where a page has more than one column, 'col. 2'). Words or phrases inserted above the line in the original manuscript have been denoted <thus>. Editorial insertions have been denoted by square brackets. All deletions are recorded in footnotes on the page. Chemical and other symbols have been transliterated in square brackets. In documents a, h, and p, 'V.S.','E.B.' and 'C.' have throughout been expanded where appropriate to 'Volatile Salt', 'Electrical Body' and 'Copper'. For details of the various handwritings found in the documents, see *Works*, vol. 1, pp. c–cii, and Michael Hunter et al., *The Boyle Papers* (Aldershot, forthcoming), ch. 1. For facsimiles of the texts from the Boyle Papers included here, see the section 'View Boyle manuscripts online' on the Boyle website, www.bbk.ac.uk\boyle.

THE TEXT OF ROBERT BOYLE'S 'HEADS' AND 'INQUIRIES'

a. Experiments about Volatile Salts (BP 10, fol. 5)

Experiments about Volatile Salts.[1]

What bodies doe yield Volatile Salts.

What bodies doe not yield Volatile Salts. And to which of these Vegetables doe belong.

Wherein Volatile Salts differ from others.

What it is denominates a salt Volatile.

How to examine Volatile Salts.

Of the properties of all Volatile Salts as such.

Whether Volatile Salts have peculiar or specific properties.

Of the way of makeing Volatile Salts in quantity.

Of the way of makeing them without the violence of fire.

Of the way of takeing away or lessening their stinck.

Of the way of takeing away or lessening their fugacity.

Of the consistence of Volatile Salts as to fluidity and[2] firmness, and the way of changing it.

Of the way of[3] examining the strength and salt of Volatile Spirits.

What bodies Volatile Salts will dissolve as a Menstruum and what not?

Of defleameing Volatile Spirits.

Of the enmity between a Volatile Salts and acid.

[1] in margin in pencil.
[2] followed by 'o' deleted.
[3] followed by 'changeing' deleted.

Of the affinity between Volatile Salts & Alcalys.

Of the affinity betwixt Volatile Salts and the Anonismous [?] Spirits.

Of the relation of Volatile Salts to the Menstruum Catholicum and of the compounded Menstruum.

Of the affinity betwixt Volatile Salts & Sulphurs.

Of the affinity betwixt Volatile Salts & Oiles.

Of the Aromatizeing of Volatile Salts.

Of the cognation between Volatile Salts & [spirit of wine]

Of the keepeing Volatile Salts.

Of the præserving of other bodies by Volatile Salts.

Of the transmitting Volatile Salts into other Substances.

Of the compounding Volatile Salts with other salts.

Of the compounding Volatile Salts with other[4] bodies by way of Menstruum.

Of the compounding Volatile Salts with other bodyes by way of Medicine

Of the compounding Volatile Salts with other bodys by way of præcipitation.

Of the figures of Volatile Salts both in visible Chrystalls, and as to their insensible parts.

Of semivolatile Salts.

Of Volatile Salts in particular and especially of sal Armoniac

Of Urine alone.

b Magneticall Tryalls (made & to be made) (BP 10, fol. 57)

Magneticall Tryalls (made & to be made)

Try the weight of severall Loadstones differing as to Countreys, Colour, Texture, &c in Water.

Try how much they loose of their Weight by Ignition, & by the Sun Beams.

Try whether the[5] Magnett will loose either of Weight or Vertue by parting with its Tincture.

Examine the Tincture when the m[enstruu]m is abstracted.

Try whether the new Tincture will animate a[6] disanimated Stone.

Re[member] the magnetism of Bullets according to the perpendicular Axis.

[4] followed by ‘salts’ deleted.
[5] altered from ‘they’.
[6] altered from ‘an’.

Try likewise that of Ellectricall Bodies of Steel.

Try the conveiance of magneticall vertue & observe how it will act in that Body.

Try the inversion of the Poles of a Small Magnett (whether disanimated or not) by the durable Application of a great one.

Try whether a disanimated Magnett will recover any considerable part of its vertue by being exposd to the Air.

Try what the greater or lesser lastingness of the Application will doe towards the invigorateing[7] either of a disanimated Loadstone or of a peice of Steel.

Try whether a Bullet when actually ignited will be magneticall.

Try[8] in that state, <how the> vertue ‘twill receive from a vigorous Magnett may be communicated to it.

c. Experiments to be made in seald Receivers (BP 10, fol. 118)

Experiments to be made in seald Receivers.

Sealing up of blood.

Sealing up of raw flesh.

Seal up the heart of a fish. [F]

The sealing up of *Caro Cocta*. [AB]

Sealing of Bread. [A]

The sealing up of Insects.

Sealing up of rotten wood that shines.

The sealing of faintly shining fish.

Sealing up a peice ready to shine but dos not actually shine. [B]

The sealing up of Camphire. [G]

Sealing up of smoakeing spirit of niter.

Sealing up of spirit of salt & filings of [iron] & [acetum destillatum] & Corall.*

The sealing up of Raisons. [R]

The letting in of aire into a vessell well exhausted & observing the Refraction. [G]

Sealing up an <ordinary> Needle [G]* &

sealing up a magneticall needle in distinct Glasse. [G]*

[7] followed by ‘of’ deleted.
[8] followed by ‘whether’ deleted. Three words later, ‘how the’ replaces ‘the’ deleted.

Seal up a litle Brimstone & try to burne it. [Gq]

To seal up a graine of Gun powder & kindle it. [Gq]

Seal up spirit of [sal] armornick & of urine & try to [sublimate] the [sales]. [G]

Seal up fresh [ ][9] & try whether twill putrifie. /col. 2/

Remember to put some of the metaline Gum into a Receiver to try whether twill chang colours. [G] [10]

Seal up an empty glasse in order to weigh the aire.

To seal up some water & afterwards freeze it, & observe whether[11] it will have Bubbles &c.

To seal up Quicksilver to try whether t’will rise, or whether t’will præcipitate per se.[12] [G]

To seal up minium in a Pipe with water. [G]

To seal up some Soape & try whether t’will easily make bubbles, & whether those Bubbles if make any will be colourd as usually.*

To seal up new milk & fresh Creame & try whether some Separations will be made as in the aire. [A]

To seal up shaveings of Box &[13] C[ornu] C[ervi] & try whether they will yeild the same things as in the aire. [C]

To try whether the Aire highly expanded in a seald glasse, will be further expanded by a moderate or strong heat. [G]

To seale up a small watch & try how t’will goe. [GX]

To seale up a squib or wild fire & kindle it with the Sun Beames. [Gq]

To seal up a Hawks Bell & observe the sound.[14]

To seal up fresh blood freed from aire & observe the colour of the upper surface whilst seald, & when the aire is after let in. [G]

d. Untitled heads on elasticity (BP 10, fol. 132)

What Bodys are Naturally endowd with elasticity.

What Bodys Naturally want Springs.

[9] MS damaged.
[10] entry inserted.
[11] followed by ‘leas’ deleted.
[12] altered in composition, as is ‘a’ in the next entry.
[13] followed by ‘leve’ deleted.
[14] followed by ‘G’ deleted. The whole of the next entry is crossed through in ink.

What Bodys there are that have Springs under some Dimensions, & not under others, & <but> what[15] measures <as to> length & thicknesse they appear to have, & not to have a Spring.

What B[odys][16] not Naturally or always elasticall are capable of being made soe.

What[17] Bodys Naturally Elasticall may be depriv’d of their Spring (to this belongs the Glasse of Lead & other Minerales per se, & the reductions of that Minerall.

By what operations & meanes Elasticity[18] may be introduc’d into Bodys, as fusion hammering, wire drawing &c.

By what Operations & meanes the Elasticity of a Body may be destroyd, as nealing, melting &c.

What are the cheif & most usuall Concomitants of Elasticitie, & of the absence or losse of it.

What are the degrees of Elasticity in Bodys <& how they are to be measur’d & æstimated, especially considering the length of the Body, & degree of flexure.>

Whether there be differing kinds of Elasticity, & if there be what, & how many they are; as whether the Spring of the Aire be of the same kind with other Springs; <to which head belong the consideration of Leather, Lutestrings, &c. that may be suspected to have a spring[19] (or motion of restitution) inwards.>

Of the duration of springinesse in Bodys, <&>[20] whether time alone will lessen or destroy it, as in sword blades, or Aire kept very long rarify’d.

Of the *Confacientia* to Springinesse, as slendernesse & thicknesse of the Elasticall Body, whereof the one is /fol. 132v/ necessary to make Glasse springy, and the Other makes the Lathes of Crosse Bow’s much more spongily Elasticall; the length of the springy Bodys, heat, which intends the spring of the Aire.

What[21] things are Hostile to Springynesse, as cold, too great, or too long flexure in some Bodys, certain applications of heat in other Bodys, as nealing & hamering Silver.

Quaere: Whether intense cold, <or>[22] the absence of the Aire when tis withdrawne in the exhausted Receiver or the density of the Aire (which may be tryd in the compressing Engine) or the change of texture that may be supposed reducible[23] in steel when the Loadstone (as if the Spring of a Watch was strongly imbu’d with the vertue of a vigorous Loadstone, or the steeping of a Body in Convenient Liquors, as if whalebone was long[24] infusd in Oyle or [Spirit of Wine], or a peece of hammered Silver drenchd with Mercury, or a[25] Lutestring imbu’d with Oyle or Water, will

[15] followed by ‘length’ deleted. Two words later, ‘as to’ replaces ‘of’ deleted, and, after ‘length’, ‘&’ is altered from ‘or’.
[16] followed by ‘are’ deleted,
[17] preceded by an illegible deletion.
[18] altered in composition.
[19] continuing in margin, linked by note.
[20] replacing ‘as’ deleted.
[21] preceded by ‘of’ deleted.
[22] replacing ‘&’ deleted.
[23] altered in composition; followed by ‘b’ deleted.
[24] followed by ‘infy’ deleted.
[25] followed by ‘peece’ deleted.

destroy or[26] considerably change the Elasticity of Bodys. Try also how far and upon what account rust will prejudice the spring of a Watch or of other Bodys capable of rusting.

Of the effects & Operations of Springs in reference <either>[27] to the Bodys that are endowd with them, or to other Bodys.

e. Heads concerning Tastes (BP 10, fols 133v–4)

The First Draught.

The History of Tasts as they belong to the Object that is said to be endowd therwith

What Tasts are as Affections of the Sentient, & what as they are Attributes of the Savorous[28] Bodys in which last sence we shall hereafter take them.

Whether Tast may reside in invisible Corpuscles, or require the Contact of some grosse or visible Body.

What Bodys doe afford Tasts.

What Bodys are insipid.

How many kinds of Tast there are, and how to be distinguisd.

Whether Man by his Sensory be a competent judge of the Insipidnesse of Bodys if they seem sapid[29] to Doggs & other Animalls.

Whether divers Bodys that seem insipid, be not soe only for want of Excitation.

Of the Generation of Tasts, both by a propper Production, or by the relection of latent or disguisd Tasts.

Of the Production of Tasts by composition

Of the production of Tasts by emergencys or by transmutation.

Of the production of Tasts that thô compounded, are Neutrall in respect of the Ingredients

Of the destruction of Tasts, by what ways it may be performd.

Whether Tasts require or admit a Medium, & if they doe, what the Medium’s are.

Of the Sphere of Activity of sapid Bodys.

Of the Subtlety of sapid Corpuscles, and how little wast they make in some Bodys though they make more in others. /fol. 134/

[26] followed by ‘sensibly’ deleted.
[27] replacing ‘both’ [?] deleted.
[28] replacing ‘Odorous’ deleted.
[29] altered in pencil from ‘insipid’.

Whether too great a subtlety may not make Corpuscles that otherwise would be sapid, unfit to be tasted.

Of the adhærency of sapid Bodys to other fluids, & the permanency thereof.

Whether Tasts belong to Salt, or any one determinate Principle of Bodys exclusively to others.

Of the various changes of Tasts, & particularly of those that belong to putrid Bodys, Animall or Vegetable.

Of improveing pleasant Tasts & preserveing them.

Of correcting bad Tasts <by>[30] prevention, or cure.

Of the transmutation of good & bad Tasts into one another.

Of the Effects of Tasts good & bad upon the Bodys of Animalls, especially of Men.

Whether Tasts have these Effects as Tasts, or as Corpuscles qualify’d with such a size, shape motion &c.

Of the ways of seperating & preserving the sapid parts of Bodys.

Of the duration of Tasts in some Bodys.

Of the imprisoning & disguiseing of Tasts.

Of the affinity & difference between Tasts & odours.

Promiscuous Experiments & Observations about Tasts.

Of the Desiderata in the History of Tasts.

Of the Optatives about Tast, especially that Men were able to imitate by composition or preparation any naturall Tasts, as they are able by the mixture of Pigments to represent any Naturall colour.

f. Heads concerning Odours (BP 10, fols 135v–6)

A Rough Draught.

Of The History of Odors as they belong to the Object
that is said to be endow’d therewith.

What Odors are as affections of the Sentient, & what as they are Attributes of the Odorous Body, in which last sense we shall hereafter take them.

Whether Odors be immateriall species, or resident Incorporeall Effluvia, & why this enquiry is presmisd [sic] rather than pospon’d.

What Bodys doe afford Odours.

[30] in pencil, altered from ‘in’.

What Bodys are inodorous.

Whether Man by his Sensory be a competent judge of the inodorousnesse of Bodys if they seem odorous to Doggs & other Animalls.

Whether divers Bodys that seem inodorous be not soe only for want of Excitation.

Of the Generation of Odors both by a propper production, or by the relection of latent, or disguisd Odors.[31]

Of the production of Odors by composition.

Of the production of Odors by emergency or by transmutation.

Of the production of Odors, that though compounded, are Neutrall in respect of Ingredients.

Of the extinction or destruction of Odours, as in the kindl’d smoak of a Candle.

Of the diffusion of Odors & the things that promote & intend it, as Heat, friction, favourable winds &c.

Of the Medium’s of Odors, & whether water be one of them.

Of the Impediments of the diffusions of Odors, as a thick or moist medium, contrary winds &c. /fol. 136/

Of the subtlety of odorous Effluvia, & how little wast they make, in some Bodys, thô they make more in others.

Of the Sphære of activity of Odors.

Of the[32] tendency or line of Odors.

Whether too great a subtlety may not make Effluvium’s very unfit to be smelt, as in very hot weather, & in the kindld smoak of a Candle.

Of the adhærency of Odorous Effluvia to other Bodys, & the permanency thereof.

Whether Odors belong to sulphur, or any one determinate Principle of Bodys exclusively to others.

Of the various changes of Odors.

Of the Odors that belong to putrid Bodys, Animall or Vegetable.

Of exalting good Odours & preserveing them.

Of correcting evill Odors by way of prevention, or cure.

Of the transmutation of good & bad Odors into one another.

Of the Effects of Odours good & bad upon the Bodys of Animalls, especially of Men.

Whether Odours have those Effects as Odours, or as Effluviums.

Of the wayes of Extracting & preserveing of the odorous parts of Bodys.

Of the duration of Odors in some Bodys.

Of the imprisoning & disguiseing of Odors.

Of the affinity of Odors with Tasts.

[31] altered in composition, apparently from ‘Bodies’.
[32] followed by ‘de’ deleted.

Promiscuous Experiments & Observations about Odors.

Of the Desiderata in the History of Odors.

Of the Optatives about Odors, especially that Men were able to immitate by composition any Naturall Odor, as they are able by mixtures of Pigments to represent any Naturall Colour.

g. Anatomical Experiments proposed To be tryed (BP 18, fols 129–30)

Anatomical Experiments proposed To be tryed[33]

To try what effect the straiter[34] or looser trying of the *Par vagus* at the root will have upon sensation.

Try what effect the cuting off that root will produce in case the Animall surrvive it, & especially what effects these Experiments, or either of them will have on the intensity of Sensation <as>[35] hunger, thirst, lust &c. and upon the supposed passions of <anguish>[36] fear, joy, upon ther presenting of objects fit to excite those inward Sensations, & Passions.

Try what the ligature or cuting off of any particular branch of the *Par vagus*, or the like operation in any other Nerve will doe towards varying the *Phænomena* of Sensation.

Try what the cuting or tying of some particular fillaments at[37] the root of the *Par vagus*, or at any other Nerve, will have upon the Sensation of that Nerve in case it[38] doe not cast the Animall into Mortall Convulsions.

Try what will be the effect of tying or cuting the extremity of a Nerve, where it terminates within the belly of a Musle, and the cuting of any filaments or fibres of that Nerve within the Body of the Musle in case a nerve be found visibly to communicate any to it.

To try what the applying of Opium (in a more dry or a more liquid Forme) to the outside of a Nerve will offer it as to the Sensation of the part it belong toe.

Try what the pricking <or wounding> of a Nerve [39] layd open in a dissected Animall, will doe as to the Sensation or motion of the part it goes toe, and that which it comes from. /fol. 129v/

Try whether a strong Ligature being made in a denudated Nerve, the pricking of it towards the extreame parts, will cause any convulsion, or have sensible operation

[33] in pencil.
[34] altered from ‘strainter’.
[35] replacing ‘as’ deleted.
[36] replacing ‘affleur’ [?] deleted.
[37] replacing ‘of’ deleted.
[38] followed by ‘cast not’ deleted.
[39] followed by ‘wit’ [?] deleted.

towards the braine, or the pricking it betwixt the ligature & the braine, will cause any <convulsion or> sensible motion[40] beyond the Ligature towards the Limbs.

Try whether in a dissected Animall a Nerve being layd open, & some filaments only of it with a sharpe pair of[41] sizars, the convulsion will be uniforme, or the effect will be far greater on[42] those parts to which the dissected filaments belong, then on those to which the other filaments reach.

To try if there will be any considerable difference in the convulsion or other effect of a *Solutio continus* in Nerves, as it is made either *sinnitim* or *cæsim* or by cuting some filaments transversaly, or sliting the Nerve, according to the *Ductus* of the Filaments.

Whether two strong Ligatures being made in a Nerve not very far distant[43] from <each> another, the pricking or wounding the intermediate part, will have any operation on either part without the Ligatures; & whether the pricking or wounding the Nerve at either of those parts will[44] have any effect on the intermediate part.

Whether a Nerve quite cut asunder neer the brain or the spinall marrow, the pricking or wounding <the inferior>[45] parts, will have any <manifest> operation on[46] the Muscles it lends toe; and the doeing the like to the superior part will have any upon the Braine.

Whether it be practicable to take a young Puppie and takeing off <good>[47] part of the tender scull, keep it from growing to a hardnesse without destroying the life of the whelp, for if this can be done[48] many things may be try’d about the Nerves & Sensation by the help of this apperture that have not yet bin try’d. /fol. 130/

Whether the[49] Head of a Puppie newly whelp’d or some other[50] *Embrio* or *fætus* whose scull is very tender, being skilfully lay’d open in a warme place, cutt, prickings,[51] strict ligatures, & such kind of painfull impressions made on the Limbs or some of the internall parts, or some of the remoter parts of the Nerve lay’d open <…lly if…n by…ally…f the…Origine… nes will…vulsions in such determinate Limbs>,[52] there will be any convulsive or other sensible motion made in the Brain it self, in its Appendices, or may assist us to find out the seat of Common sense, or be otherwise luciferous to the document[53] of Sensation.

Whether when the[54] Skull of a whelp or other fætus is yet very tender, it be possible by Bandages & other propper meanes (skilfully try’d, & vary’d as occasion invites) soe

[40] followed by ‘being’ deleted. Three words laterm ‘Ligature’ is followed by ‘by’ deleted.
[41] followed by ‘siss’ deleted.
[42] altered from ‘in’.
[43] altered from ‘distance’. Two words later, ‘each’ replaces ‘one’ deleted.
[44] followed by ‘bey’ deleted.
[45] replacing ‘any of the two’ deleted.
[46] replacing ‘of’ deleted.
[47] replacing ‘a’ deleted.
[48] followed by ‘the’ deleted.
[49] followed by ‘scull’ deleted.
[50] followed by ‘Animall’ deleted.
[51] followed by ‘to other’ deleted.
[52] this marginal addition is damaged, with two to three words missing at each ellipsis.
[53] followed by ‘then’ deleted. Two words later, the full stop replaces a comma, and is followed by ‘espec’ deleted.
[54] followed by a deleted letter.

to alter the figure of the Brain,[55] the capacity, or figure of the Ventricles, as to make the Animall either to grow stupid or forgetfull, or to[56] have any function what is to be ascribd to the soul, notably either for the worse or for the better.

Whether by binding on <& constantly keeping on the part> some conveniently shapd Body, on some fit parts of the tender head of a whelp, the skull may not soe [sic] moulded as by a depression of the *Cranium*, <as that by the>[57] compression of some of the internall parts, some of the outward senses[58] not to say anything of the <more generall privie> facultys[59] to the soul, may be either abolishd, or lessend, or deprav’d; and then the dissection of such a Head may show us what internall vibrations of the Brain [60] or Nerve, those Distempers may be imputed toe.

Tryall may also be[61] made by reduceing the fore part, the middle part, & the hinder part of the skull, (the first in one Animall & the two last in others) to grow very much depressd, whether any light may be thence obtaind towards the determining of /fol. 130v/ [62]the Controversie whether the imagination, the Memorie, & other faculties have distinct seats in the Brain, & whether if they have any, they have those assignd them by Authors.

Whether the eyes of a Puppie being sewd up <or otherwise carefully <& securely> closd> before the 9th day or sooner for the more[63] certainty the <whelpe> being sufferd to continue in that [?] condition till he be growne a Dogge his [?] eyes being then opend, he will[64] show [?] any considerable Phænomena about… [65] as whether he will endure the light well & his pupills will have the like aperture with other Doggs.

Whether[66] the opticks or axes of his eyes will be both directed the same way, and every object he looks at, or whether it can be collected that he sees <things> double, whether he can[67] choose his way as other Doggs without deviating, reeling &c. & whether he makes of[68] æstimates as well as they of distances.

A Dogge having one of his eyes exactly coverd, whether he will not mistake distances &c. any more than when he had them both free.

Whether a Dogge being conveniently plac’d, may be soe deceiv’d by the image of a peece of meate[69] throwne out by a spherical Glasse, as to chop at it, &[70] by what the other Glasse, he may be deceiv’d, especially by spectacles made with multiplying (not magnifying) Glasses after he <has>[71] has bin us’d toe <other> Spectacles.

[55] followed by ‘as’ deleted.
[56] followed by ‘as wholly a’ deleted.
[57] replacing ‘& a’ deleted. Seven words later, ‘parts’ is followed by ‘either his memo’ deleted.
[58] followed by ‘as well as perhaps’ deleted.
[59] followed by ‘attributed’ deleted.
[60] followed by ‘w’ deleted.
[61] followed by ‘made,’ [?] deleted.
[62] preceded by ‘that Con’ deleted at start of page.
[63] followed by ‘securitie’ deleted. Three words later, ‘whelpe’ replaces ‘Dogge’ deleted.
[64] followed by ‘exhibit’ deleted.
[65] damage to MS, as with queried words in previous lines.
[66] followed by ‘he’ deleted.
[67] followed by ‘do’ deleted.
[68] followed by ‘æs’ deleted.
[69] followed by ‘brough’ deleted
[70] followed by ‘how’ deleted. Four words later, ‘other’ followed by ‘del’ deleted.
[71] followed by ‘del’ deleted. Six words later, ‘Spectacles’ followed by ‘made of contexion’ deleted.

Whether by sewing up the eyes of a Dogge or other beast in a tetorted [?] position, it will appear that he see things double.

These Experiments of Eyes may be also try’d with[72] Birds & other Animalls instead of Doggs.

Whether the aqueous humor of a whelp, Lamb, or other young Animall being let out by the perforation of the *Cornua* will be regenerated without prejudice to his sight, & in what time the eye will be restord

Try to make divers Deseases in the Eyes of[73] Beasts & Try on them the severall wayes of cure.

Try what Noyses that are permitted to come in only at a passage oposite in scituation to the sounding Body, whether it holds in Doggs &c. as well as Men, that they æstimate the place of a sensible object to be in that right Line by which the immediate[74] (or ultimate) Object, effects the sensory.

Try whether the drums of a Doggs eare, being broken he will heare, & if he doe, in what[75] measures he retains his hearing & for how long time.

Try by Poisons inebriating Druggs as *Dubrion* &c to make Kidds, Capons, Calfes & other manfull [?] Animall drunk or distraught, & take notice of the Phænomena observable in them. NB. 1 Twere luciferous to make such Experiments as may be safe upon madmen (especially in Bedlame) by various things to alter, lessen & sometimes encrease their distemper, & examin their strength to remove weights, resist Cold &c. that we may conferre these Experiments with Observations [?]

NB 2. Some of these & many other Experiments may be better made upon rationall creatures that can give an account of what befalls them, were it not that they are too noble to make tryalls on.

h. Enquirys and Experiments about Electricall Bodys (BP 22, pp. 197–200, and BP 38, fol. 120)

Enquirys and Experiments about Electricall Bodys.

What Bodys are Electricall and what not. What are the differing kinds of Electricall Bodys as Amber, Jett, Resins, Sulphurs, Diamonds, Christall, Sparse, Glasse, Cornelians, &c.

Whether all Gumms, as Gum Arabeck, and those only that are solluble in water and aqueous Liquors, and whether those Gumms that are solluble both in water and Oyle, and whether also all sulphurs, as that of Antimony, and of Mars, are Electricall.

[72] followed by ‘Birds’ deleted. Two words later, ‘&’ followed by ‘with’ [?] deleted.
[73] followed by ‘a Dog’ deleted.
[74] followed by ‘object’ deleted.
[75] followed by ‘maner’ deleted.

Whether the same Body may be Magneticall and Electricall, which question is to be determin’d by the Glasse of Iron made at the smelting mill, and by vitrify’d steel.

Whether the same Body may be made without addition (by a bare change of Texture,[76] to be sometimes Electricall, and sometimes not Electricall (to be try’d in Glasse of Lead and in that of Copper or of Silver made per se).[77]

To try the Operations of two Electricall Bodys plac’d at opposite places of the Body to be attracted, and either of æqual force or of differing, and plac’d at æquall or unæquall distances &c.[78]

Whether a large and strong Electricall Body will attract without being at all rubd, and whether it will doe soe at all seasons of the year and in all kinds of weather without excepting frosty.

Whether Quicklime and Minium being colliquated into a vitrum Saturni, will compose an Electrical Body.[79]/p. 198/

Whether Amber &c. will be excited by haveing its small parts put into motion by any moderate heat <(as of the sun &c.> and ev’n that of warme water, without [there] being the intervention of frication.

To <measure>[80] the attractive power of Electricall Bodys by a nice pair of Scales, to one of which the Body to be attracted is to be conveniently <tyd or> fasten’d.

To try whether Electricall Bodys will at all attract under water, or other Liquors.

To try whether the extract of red Amber will be more Electricall then the Amber itself was; and whether Amber unbroken being infus’d[81] in pure [spirit of wine] often renu’d till the Liquor will yeeld no more tincture, the remaining Lump will have its Electricall vertue[82] lessen’d, encreasd or neither.

Whether the Colophony, if I may soe call it, that may be obtain’d from Amber <distild> warily and per se, will after the recesse of the salt and volatile Oyle, and of the phlegme & spirit, be Electricall, and more or lesse so then Amber it self was.

Whether the mixture of[83] differing Electricall Bodys as hard wax & Rosin, will make the composition more or lesse Electricall then the Ingredients;[84] Whether this mixture be made by fire, or by dissolving them both in rectify’d [spirit of wine], and afterwards totally and slowly abstracting the Menstruum.

Whether in case Oyle of Amber, or the Balsome of it, made per se, can by a mixture of snow and salt be made to freeze, that frozen Liquor will be Electricall.

Whether the parts of distill’d Amber <distill’d per se> being reunited into a kind of Resin, will be Electricall /p. 199/ and if they be, whether the mixture will be more or lesse soe, then the Amber it self was.

Whether in case Oyle of Turpentine can by salt of Amber, or any other Salts, be reduc’d to a consistent Body, that will be Electricall. The like Enquiry may be made

[76] followed by ‘some’ deleted in pencil.
[77] brackets added in pencil.
[78] entry preceded by ‘L’ in pencil.
[79] this entry squeezed in at bottom of page.
[80] replacing ‘try’ deleted.
[81] altered in composition, The next word, ‘ in’, followed by ‘sy’ deleted.
[82] followed by ‘dimin’ deleted.
[83] followed by ‘two’ deleted.
[84] followed by ‘and’ deleted.

concerning all other Oyles and Balsams; as also Bodys too soft to be fit for brisk rubing, as Palme Oyle, Bees-wax, expressed Oyle of Mace &c,

Whether the various maners of nealing Glasse soe as to make it more or lesse brittle, will[85] encrease or diminish the Electricity of it, and in what proportion.

Whether Glasse either made red hot, or considerably heated, will retain[86] all its Electricall facultie, or any part of it.

What difference will be made in Amber &c. by operateing upon it with Spirit of Urine and Sal Armoniack <& other volatile salts> or <else> with Spirit of Salt, or Nitre, or Oyle of Vitriol instead of [spirit of wine].

What are the severall degrees of attractive power in Electricall Bodys of differing kinds.[87]

Of the Sphere of activity of Electricall Bodys how far it reaches.

In what proportion[88] if in any the attractive power in Electricall Bodys decreases according as the Body to be drawne is remoter from it.

What[89] kind or measure of friction dos give an Electricall Body its highest power of attracting; by what degrees of friction it attains [90] that power, and if it be heated by friction beyond what is requisite to its utmost energie, [?] by what degrees its attractive power will be impair’d. /p. 200/

Whether a Lump of Amber will attract a small Needle or a peece of it whilst it is red hot.

Whether an Electricall Body will[91] retain its attractive vertue intire or unimpair’d in our Receiver when it is carefully empty’d of Aire.

Whether a peece of Amber being turnd into a solid Globe there will be anything remarkable discoverd by that figure in reference to the way and force of Electricall Effluviums.

Whether Electricall Bodys, attract more forcibly in any one position then in another, accounting for the <differing>[92] gravity which the Body to be drawne may have according to its differing Scituations.

Whether the action of an Electricall Body or the motion of the effluviums by which it is perform’d be made in[93] any certain lines as straight, circular, ellipticall, &c. which may be try’d<, by severall ways, as> by small bitts of downe fastend to soft wax, or by Liquors to whose smooth surface the Body may be applyd.

Whether a strong Electricall Body will attract the surface of the Liquors, especially good [spirit of wine] and Oyle.

Whether an Electricall Body will attract all light Bodys indifferently, and particularly Ocymum and flame, either of a Taper or [spirit of wine].

[85] followed by ‘var’ deleted.
[86] followed by ‘its’ deleted.
[87] followed by ‘of’ deleted.
[88] followed by ‘the at’ deleted.
[89] altered from ‘Whether’.
[90] followed by ‘at’ deleted. Six words later, ‘be’ followed by ‘Whether being’ deleted.
[91] followed by ‘attain’ deleted. Eight words later, ‘in’ followed by ‘the exha’ deleted.
[92] replacing ‘greater’ deleted.
[93] followed by ‘among’ deleted. Two words later, ‘certain’ duplicated and the first deleted.

Whether an Electricall Body being suspended at a nice pair of Scales, and rubd till it emit an Effluvium, not only strongly attractive, but such as may be smelt, will loose anything discernable of its weight. /BP 38, fol. 120/

In what proportion Amber and other Electricall Bodys wast; and whether the deperdition doe considerably vary according to the Seasons of the Year, or according to the Weather.

Whether a round, or oblong peece of Amber of a considerable bignesse being rubd in one part; the Electricall power will be excited in the opposite, and also in the intermedaries, and in what measures it will be soe according to the distance of the other parts from that which is excited.

Whether the interposition of any sollid medium thô never soe thin, will quite hinder the attractive vertue of Amber; this to be tryd by the interposition of the finest Paper betwixt a light Body, and a lump of excited Amber, as also by filling a very thin bladder with Rosin according to my way of mollifieing it without actuall heat, as also by suffering Turpentine, put into a thin Bladder half open’d to evaporate in the shade till it <come>[94] to a consistence.

Whether one Electricall Body will attract another either of the same, or of differing kinds.

Whether one excited Electricall Body will excite another, either of the same or of differing kinds,[95] to be tryd by Electricall Bodys placd in little Boules on water.

<Whether by that expedient two Electricall Bodys excited may be brought to make a coition.>[96]

<Whether an Electricall Body excited & floating may be drawne by its owne effluvia to a Body not Electricale conveniently stop’d, as a Body with a large & somewhat concave superficies, stuck over with downe, feathers, peeces of strawe, &c.>

Whether if two Electricall Bodys be both excited, & conveniently plac’d, they will attract one another more strongly then if one only were soe.

Whether Electricall Bodys will draw those that are plac’d within the sphere of their activity[97] though the interjacent Aire be alter’d as by a hot Iron placd beneath it, or the fumes of [spirit of wine] and several other Bodys.

Whether Electrical Bodys excited presently loose their force if the superficies be moisten’d with any Liquor /fol. 120v/ and if[98] with some Liquors and not with others. And whether the like happens in case the Body to be drawne be wetted.

Whether the Body to be attracted <may> be soe plac’d that the Electricall Effluvia, shall in certain conjuncture of circumstance drive it away.

Whether compression by weight or otherwise without friction will excite an Electricale Body.

[94] replacing ‘come’ deleted.
[95] followed by ‘&’ blotted and deleted; the rest of the sentence added between the lines.
[96] This sentence and the next added in the margin, keyed to the text at this point.
[97] followed by ‘will be’ deleted.
[98] accidentally repeated and the second deleted.

i. Concerning Shining Wood (BP 25, pp. 392–3)

Concerning shining Wood.

1. Observations to be made.[99] Tryalls to be made.

2. Try what severall degrees of warmth and heat will doe towards the Increase diminution or Extinction of shining Wood.

3. Try what <operation> Cold either naturall, or artificially procurd by snow & salt, will have upon it.

Try also the operation of a very moist aire as a Cellar; & likewise very dry, or an Easterly or northerly wind, or the Blast of a pair of Bellows.

4. Try whether a peice of clear <& also>[100] & thin colourd glasse being layd on it the light cast by the wood thrô the glasse will be ting’d.

5. Try whether corrosive Liquors, especially clear oyle of vitrioll by the spoyling the Texture of it, will[101] destroy or alter the Light.

6. Try whether [spirit of wine] will by preserving the wood, preserve, or by penetrating it, injure the Luminiousness & whether the same Liquor being layd on Wood that is just ready to become shining will hinder it to doe soe by checking[102] the Putrefaction.

7. <Try whether in case the [spirit of wine][103] extinguist the seeming fire, upon the slow evaporation of the [spirit of wine] the wood will regain any part of its Light.>[104]

8.[105] Try also what Effect [oil of Tartar] per deliqium urinous spirits & [oil] of Turp[entine] &c. will have; some of, that being applyd warme as well as Cold.

9. Try, with a pendulous Experiment whether any warmth can be perceived. /p. 393/

10.[106] Try whether compressing or crushing it with severall degrees of force between 2 peices of clear glasse, its Light will be diminishd, extinguishd or increasd. <Try the like with shining fish.>[107]

11.[108] Try whether shining wood will shine more or lesse[109] in the Exhausted Receiver then when ‘tis <againe> full of aire, [110] or then it dos in the open aire.

12. Whether <shining>[111] wood being carefully seald up in a thin Glasse soe as that it be not over-heated <in>[112] the Operation, it will continue to shine as long or neer as

[99] over a blank column: see Introduction, p. xi.
[100] subsequently deleted.
[101] followed by ‘spoy’ deleted.
[102] altered from ‘cheating’.
[103] followed by ‘of’ deleted.
[104] addition in margin in hand F.
[105] replacing ‘7’ deleted.
[106] replacing ‘9’ deleted.
[107] added by Boyle.
[108] replacing 9, itself replacing 10.
[109] followed by ‘than before’ deleted.
[110] followed by ‘&’ deleted.
[111] replacing ‘rotten’ deleted.
[112] replacing ‘by’ deleted.

long as otherwise, notwithstanding its being hinderd from any intercourse with the ambient aire.

Whether a peece of shining Wood being put in the Receiver will upon the[113] withdrawing & readmitting of the aire have the fate of a kindld coal, & loose & regain its light [114]

13. Whether a peece of wood seald up Hermetically as is mentiond in one of the former Experiments, will retain its Luminousnesse in the Exhausted Receiver well as before the aire is withdrawn & after its return, & soe will show that the pulse that makes light is able, thô it spring from within a Hermetically seal'd Glas, is able to[115] propogate itself through the Glas, & <either> is made upon the æther (whether aire be mix'd[116] with it or noe) if it be a meer pulse, or can move freely in a Vacuum as to aire, if Light be a Corporeall Effluvium.

14. What is the specifick gravity of rotten wood in reference to water.

15. Whether shineing wood being kindld will easily flame, or whether it will slowly burn away like Touchwood.

16. Whether the smoak of it being held under the face will have an acute & saline smell, & will by its acrimony make the eyes water.

17. Whether the Ashes that remain of this wood will have any fixt salt as those of other wood. And whether these Ashes will differ from those of rotten wood that has not yet shone & from those of rotten[117] wood that has ceasd to shine.

18.[118] What substances destillation will obtain from[119] cours [?] wood & which will not appear that noe parts will come over luminous.

j. Titles for the Natural History of Water (BP 26, fols 49–50, with variants from BP 25, pp. 264–5)

Titles or Topica Particularia about the Natural History of Water.[120]

What is meant by water, and in what notion 'tis here treated of?

Of the various kinds of water, viz. Pump-water, spring water, River water, Rain-water, Mist-water Snow-water, Hail-water, Thaw'd Ice and Hoar Frost, Dew and the Water made out of the Air by Marbles &c. and by Chymical Glasses.[121]

[113] followed by 'en' deleted.
[114] Entire entry deleted and not numbered: see Introduction.
[115] followed by 'penetra' deleted.
[116] followed by 'in't or' deleted.
[117] altered from 'rottend'.
[118] replacing a deleted number.
[119] followed by 'fr' deleted.
[120] BP 25 lacks 'Titles or', and 'Topica' is garbled as 'Tofrica'.
[121] Here, BP 25 has 'Of the severall kinds of water & their difference'. This entry (lacking 'various') appears right at the end. At the end of it, the words '& Deliquated' have been added in Boyle's hand. It then has 'Paralipomena'.

Of the Gravity of water absolute and respective.

Of the Heat and Cold of water, to which belongs the Question whether it be Hot, Cold or Adiaphorous?

Of the moisture of water, and whether it be moister than the Air?

Of the Fluidity of water, wherein it consists and whether that Quality or State be natural to it and inseparable from it?

Of the Thinnes and Viscosity of waters.[122]

Of the Diaphaneity, and the differing Transparency of it, according to Heat, Cold &c.

Of the Colours, Tasts, sounds and smells of water.

Whether water[123] be a medium of smells or sounds?

Of the permanent nature of water, and whether it be transmutable into Air,[124] Earth or other Bodys simple? or compounded?

Of the Condensation of water, whether it can be effected by Cold, Compression or otherwise?

Of the Rarefaction of water; to what degree it reaches, and by what means it may be effected; as by being turn’d into vapours Ice &c?

Of the Spring of water: whether it have any distinct from that of the Air included in it?

Of the force of water, expanded either by Heat or Cold.[125]

Of the Figures ascrib’d by the Cartesians and by others, to the Corpuscles of water.[126]

Of the Figures of Drops and other small Portions of water, whether contiguous to solid Bodys, or every way environ’d with Fluids.

Of the Pores suppos’d[127] to be in water.

Of the Motions of water and particularly of its ascention in slender Glass Pipes.

Of the Mistions of water with Air &c.[128] and how much water the Air in severall degrees of Heat will imbibe without a visible condensations of the vapours? /fol. 49/

Of the Fermentation and Putrefaction of water.

Of the Depuration of water and its severall wayes.

Of the wayes of preventing the Putrefaction or stinking of water.[129]

Of the wayes of correcting stinking water.

Of the Origins of Springs, Rivers, Lakes &c.

[122] Lacking in BP 25.
[123] BP 25 has ‘Water may’ inserted in Boyle’s hand, replacing ‘it’ deleted.
[124] In BP 25, the entry ends at this point.
[125] This entry lacking in BP 25, which instead has the entry: ‘Of the transmutation of Water by Cohobations, and by the seeds of things’.
[126] In BP 25, this entry follows the next but one, on pores. The next entry there follows the one concerning stinking water.
[127] BP 25 has ‘that some Philosophers suppose’.
[128] In BP 25, the entry ends at this point.
[129] BP 25 lacks this and the following entry and instead has: ‘Of the wayes of hindering & aireing stinking water’ (which is repeated and deleted three entries later).

Of Hot Baths.

Of Mineral waters sulphureous, Aluminous, saline, vitriolate, Antimonial, Nitrous &c.

Of the Putrifying waters, and others of odd Qualitys.[130]

Of poysonous waters,[131] and their differing kinds.

Of the Medical vertues of water.

Of the wayes of Estimating the Salubrity & unwholesomenes of waters.

Of the serviceablenes or unfitnes of water for Oeconomical uses, as Brewing, Baking, washing &c.[132]

Of the wayes of correcting the bad Qualities of water, and improving its others.

What Bodies water as a *Menstruum* will dissolve and what not?

Of the Mechanical (and some other) uses of water;[133] as in Dying, tempering of Steel and Iron, seasoning of Timber for ships &c.

k. Titles for a Natural History of the Sea (BP 26 fols 51v–2)

Titles and Articles of Inquiry in Order to A Natural History of the Sea.

1. What is meant by the *Sea* as distinguish’d from other waters? and in what sense ‘tis treated of <in> the present History?

2. Of the colours of *Sea-water*, and their differences, according to their remotenes from shores, and from the mouths of Rivers, as also from their bottoms, from their various Depths &c.

And particularly, whether the Sea-green colour usually observ’d in deep Seas, proceeds only from the depth of the water, or at least in part, from some other causes.

3. Of the Luminousnes or shining of the Sea, whether it be observable some time or other in all Seas, or only in some?

4. Of the Diaphaneity of Sea-waters compar’d with fresh waters and with one another. <And to what Depth Objects may be seen beneath the surface of Transparent parts of the Sea.>[134]

5. Of the Semi-Opacity of the Sea, and its power to reflect Light, compar’d with the reflecting power of the Earth.

6. Of the Odours of Sea-water

[130] BP 25 lacks this entry.
[131] In BP 25, the entry ends at this point.
[132] BP 25 lacks this and the following entry and instead has: ‘How much water the Air in severall degrees of heat will mimbibe, without a visible condensation of the vapours’.
[133] In BP 25, the entry ends at this point.
[134] in margin.

How far One may smell the Sea on the firm Land?

And whether any Sea-water not imprison’d affords that scent of violets, that is often observ’d in means of Bay Salt, made by the Sun on the Coasts[135] of France in *Poictou* and *Xaintonge*.

7. Of the Tast of Sea-water, whether it be purely Salsuginous, or partake not, at least in some places, of bitternes, or do not relish of *Bitumens*.

8. Of the Temperature, as to Cold & Heat, of the submarine Regions (reaching from the surface of the Sea to the bottom).

Of its various degrees of Heat & Cold, according to Depths, Climates, seasons of the Yeare, soiles &c.

9. What is to be thought of the vulgar tradition, that Sea-water is unfit to quench Fire.

10. Of the Indisposednes of Sea-water to be frozen, either in its own Bed or carryed ashore.

And of the differing degrees of that Indisposition, according to the greater or lesser saltnes of the Sea, and other Circumstances; as also compared with other Liquors.

11. Of the Constituent parts of Sea-water, especially as they are discoverable by Distillation.

12. Whether fresh water may be separated from Sea-water by Glaciation.

13. Of the Gravity of Sea-waters, in reference to fresh waters and to one another.

Whether it vary not in Summer & Winter; and on other accounts, especially the difference of Climates.

And whether in the same season the Seas gravity proceed only from the greater or lesser proportion of salt that is in it, and not something also from other causes.

14. Whether it be probable, that the Sea was created as salt as it is now, or whether at least in many Parts, it derives not its saltnes from the solutions that the aqueous parts of it have formerly made, and do stil make, of the salts of the Earth?

15. Of the proportion of salt that is in the water of different Seas.

Whether in the same Sea it be not alwayes the same?

And if it be not, how much, and in what Circumstances it varies?

16. Whether upon the surface of the Terraqueous Globe the extent of the Sea, be equall to that of the Land?

And if not, how much it exceeds or falls short of it?

17. What can be observ’d of the Figuration of the Seas from North to South, and from East to West, and this in the severall Hæmispheres & Climates of the Terraqueous Globe?

18. Whether there be any secret Communications between distinct Seas, by subterraneal Channels or conveyances?

19. Of what depth the Sea in severall places is? Whether any one Sea be higher than another, in reference to the Center of the Earth?

[135] altered from ‘Coast’.

The order of the Increase and Decreements of that Depth.

And whether the bottom of the Sea do’s alwayes, or most commonly, rise towards the shore, unles accidentally interrupted?

20. Whether there be in the Sea any Abysses or unfathomable Depths, if Tryal be skilfully made to discover the Bottom, if they have any?

21. Of the bottom of the Sea, its inequalities as to Height & depth, as to difference of Soiles, as to Rocks or Mynes of Salt, as to Springs of fresh water, Liquid Bitumen &c.

That there are submarine Æstuarys capable of emitting Store of Exhalations, and even actual Flames, into the Sea.

22. Of marine Plants, whether growing where the Sea washes them continually in the water, or reaching with their heads above the surface of the water.

And particularly of the *Corcus*[136] *Maldiviensis*, which is said to be brought up by Vipers (as an Eye witnes also affirm’d to me) and produc’d by a Palm or Coco-tree, growing at the bottom of the Sea.

23. Of the Zoophytes, or Plant Animals, as Sponges.

Of the Stony Plants and *Lytho-Dendra*, as they are call’d, as Corrall white and red &c.

24. Of divers Bodies that are presum’d to be Productions of the Sea, as *Succinum*, Salt, Ambergreise, and some Anonymous ones.

25. Whether marine water will putrefy or stink, in the Sea itself or elsewhere?

And in[137] case it will, what Degree & continuance of hot weather it requires to putrify it?

Whether in the Sea itself or in separate Portions of it.

26. Of the Power that the Sea has to produce, or hasten Putrefaction in some Bodies, and to preserve others as Ships Cables &c. that are sunk into it.

27. Of the Power ascrib’d to the Sea to eject drown’d Bodies, as also *Succinum*, Ambergrease &c.

28. Whether the Sea-water, especially in great Seas and in very deep parts of the Ocean, may probably be suppos’d to hinder or much impair or otherwise notably vary, the magnetism of the Earth.

29. Of the Expirations or *Effluvia* of the Sea into the Air.

Whether they be Saline?

And if so, what sort of Salts they must abound with?

Whether any of them deserve to be call’d *Spirit of Salt*?[138] /fol. 52/

Whether the *Effluvia* be rather of a Bituminous nature?

Whether they are mingled with some other sort[139] of Expirations, that wants names?

[136] altered in composition. Ten words later, ‘Vipers’ followed by a deleted letter; two words after that, ‘an’ altered from ‘any’.
[137] followed by ‘what’ deleted.
[138] altered from ‘Salts’.
[139] altered from ‘sorts’.

Whether they make the incumbent Atmosphericall Air heavier than that which leans upon the Land:

Whether they mittigate or increase the Cold or the heat of the Air, that covers & confines upon the Sea, distinct from the most terrestrial Airs

Whether these Steams be the main cause, or at least a considerable one, of Sea Sicknes?

Whether they produce the Sea breezes, that in the Forenoon are observ’d to blow from the Sea upon the shore in many Parts of the Indies and elsewhere, especially in Islands & Coasts that are mountainous?

30. Whether there be any real Sympathy between the Moon and the Sea, or the Shell fishes of it, or any dependance of either of the latter on the former?

31. Of the motions of the Sea.

And 1. of those caused by the winds, and of their Effects the Waves.

Whether these *cæteris paribus*, answer in height to the depths of the parts of the Sea, whereon they are rais’d?

How deep Storms move the Sea, beneath the level of the water when it is calme?

Whether the tenth wave be really greater than the others?

Of the extent of Storms.

Whether there be in the Ocean such a kind of Libratory Motion as some Navigators suspects.

32. Of the Currents in the Sea, the places wherein they are observ’d.

Of their Extent, Celerity, various Tendencies, constancy of changes.

And whether there be any submarine currants that reach not to the surface of the water?

And in case there be, what Depths they begin at and reach unto?

And whether at certain times they run contrary to the Tydes

33. Of the Whirlpools and Indraughts of the Sea.

And to what causes such vortical motions may probably be ascrib’d?

34. Of the Tydes, their kinds, variations and other Accidents and *Phænomena*.

35. Of the Insalubrity of Sea-water, and to what Diseases and inconveniences ‘tis wont to make Drinkers of it obnoxious.

36. Of the medicinal Vertues of Sea-water, as in killing of worms, preserving men from the Plague, strengthning Gouty and other weak Limbs, preventing or cureing the *Hydrophobia* &c.

37. Of the Chymical Vertues and uses of Sea-water, as in Precipitation in making [sic]

38. Of the Oeconomical uses of Sea-water in dressing of Fish, in preserving by way of Pickle divers[140] Bodies, in destroying of weeds, and as ‘tis apply’d in making Corn and Grass grow, in making of Soap &c.

[140] altered from ‘diverse’.

Appendix

39. Various and Promiscuous Observations about the Sea.

40. *Paralipomena* or Things omitted in the foregoing History, and to be added to it.

I. Untitled heads concerning light and luminosity (BP 26, fol. 62)

What kinds of Bodies are Luminous and what not.

What kinds of Bodies are capable of haveing light introduced into them, and what not.

By what changes light is introduced into Bodies, as the Bolonian stone, the shineing Diamon, sea-water, sugar, the haire of a Cat, the Lancashire blew, the scales of Fish, rotten wood. &c.

Of the celerity of the action of Light.

Of it’s tendency every way.

Of the Mediums through which it will be diffus’d.

Of the Mediums through which it will not be diffus’d.

Of Semidiaphanous Bodies.

Of what happens to Light in reflection.

Of the Bodys that refract Light.

Of the other change that Light receives in passing through a Medium.

Of the affinity betwixt Light and colours.

Of the affinity betwixt Light & heat.

Of the wayes of intending Light.

Of the Production of Light with[141] a Luminous Body.

Of the innate Light of some Mens eyes.

Of the things that promote Light.

Of the things that hinder Light.

Of the things that deaden or destroy Light.

Of the privation, and contrary of Light. viz. shade and darknes.

Of the duration of Light in corruptible Bodies.

Of the efficacy and effects of Light.

Of the duration of the impressions of Light in the Eye etc.

Of instantanious productions of Light.

[141] ‘without’ in BP 26, fol. 70.

Of the making the Bolonian Stone shine by heating it when included in an opacous body.

Of the affinity betwixt Light & sounds.

m. Enquirys about Lime (BP 26, fols 75–6)

Enquirys about Lime.

What Stones will make Lime & what will not.

What Signes there be if any to know a Lime stone by.

What are the wayes of examining the strength & goodnesse of Lime.

How much Lime stone, (according to its severall kinds[)] looses of its weight by calcination.

How long Lime stone may be kept in the Aire without slacking, what the bulk of the stone dos in this matter, what may be thence collected of the goodnesse of the Lime or temperature of the Aire.

Whether very fresh Lime can be hard enough or contain sulphur enough to strike fire.

How much Lime looses, or rather gaines, of weight by slacking in the Aire.

What Menstruums will work upon Lime & what will not.

Whether Lime water <decanted> very clear be specifically heavyer than common water, or than[142] Animall spirits made by Destillation.

Whether Lime water will loose of its strength or weight[143] or both by standing open, & how much & how soon.

Whether Lime water thô exactly stopt or seald up will loose of its strength by length of time.

Whether Lime water being in good part boyld away will grow specifically heavyer[144] or lighter.

Whether Lime water will hisse or yeeld a Præcipitate with any acid Menstruum.

Whether being mingld with Spirit of Nitre it will afford any Nitrous salt.

Whether being evaporated ad siccitatem it will afford any saltpetre or other saline substance.

Whether being destilled with a gentle fire the water of[145] it will be heavyer or lighter then common destilled water.

[142] followed by ‘volatile’ deleted.
[143] followed by ‘of’ deleted. Three words later, ‘by’ altered in composition.
[144] followed by opening bracket deleted.
[145] deleted and reinstated. Four words later, ‘heavyer’ followed by ‘then’ deleted, and four words after that, ‘common’ altered from ‘commonly’.

Whether being mingld in great proportion with dolsquear’d [?] fixt Nitre, it will encrease the weight /fol. 75v/ of the fixt Nitre.

Whether well dryd Sea salt being[146] dissolvd in Lime water & gently evaporated ad siccitatem, any[147] precipitation will be made of any part of the salt, or any sensible change will be made in the figure of the graines of the tast, weight &c. of the salt.

Whether Sope can be[148] made by Oyle & Quicklime without Loes.

What difference there is in point of strength. weight &c. betwixt Lime water made with fresh Lime & that made with Lime slackt in the Aire.

Lime being corroded with Spirit of Nitre (some before & some after ‘tis slackd) whether[149] the solution coagulated will be of a Nitrous Nature.

Lime being fluxt with Seasalt whether the Liquor afforded per deliquium by the mixture will considerably differ from that of the fluxt salt alone.

What difference there is betwixt Lime of severall stones.

What difference there is betwixt Lime of stones & that of Vegetable[150] Bodys or Corall &c. and that of Animall substances, as Oister Shells Crabs eyes &c.

Whether in good Lime water the infusion of new fresh Lime (in lumps or finely beaten) will add to the specifick weight or strength, & if soe how far they may be promoted.

Whether the mixture of Lime of severall kinds will doe any thing to promote the strength of the Lime water.

In which Liquors Quicklime will be slackd & which not & in which soonest & best.

Whether the Infusion of Raisins, Figgs &c. made in <Lime>[151] water will ferment & become of a vinous Nature as if made in other water. /fol. 76/

Whether[152] there will be <any difference> in weight & other obvious Qualitys betwixt the remains of Lime carefully dulcify’d, & Ashes of wood & Bone ashes after they are exquisitly freed from salt.

Whether such dulcify’d remaines being[153] put into the Lime kill again will be brought by this new or farther Calcination to afford any more Lixivium.

Whether Lime, dulcify’d or undulcify’d, will make a considerable Ingredient of Glasse.

Whether exquisitely dulcifyd Lime will be dissoluble in the same Liquor[154] and æqually <as> that <which> has not bin dulcifyd at all.

Whether there will be any difference betwixt Quicklime made use of for a Caput Mortuum in Chymicall destillations & burnt Tobacco-pipe Clay or other Bodys that

[146] altered in composition.
[147] duplicated and the first deleted.
[148] followed by a deleted stroke.
[149] followed by ‘whether’ deleted.
[150] altered from ‘Vegetables’.
[151] replacing ‘Raine’ deleted.
[152] followed by ‘difference’ deleted and replaced by ‘there will’, also deleted. Five words later, ‘difference’ followed by ‘b’ deleted.
[153] followed by ‘dulcifyd &’ deleted.
[154] followed by ‘with as’ deleted. Two words later, ‘as’ replacing ‘then’ deleted.

are lookd upon as adiapharous & imploy’d to that purpose, & whether the dulcification[155] of the Lime makes any considerable difference in the case.

Whether Lime doe really either retain or destroy volatile[156] Animall salts, as salt or saline spirit of Urine, Blood &c.; & <if>[157] it doe whether it doe it most when ‘tis yet Lixiviat or after ‘tis dulcify’d.

What will be the affect of strong Lime water freshly made upon such volatile salts[158] by which way of trying the Effect of the Lixivium of Lime, we shall be able to know what becomes of the volitile salt, which <being skilfully exsposd to the first, must>[159] either sublime stay behind in a dry forme, or come over in a Liquor, which may be afterwards Chymically examin’d <& whether the volatile salt of soot &c. will appear[160] in this case different from Animall salts.>

Whether the crude Lime stone, before any calcination, being[161] reduc’d to powder & long pressd in well luted Glasses with vehement fire, will afford any Liquor, & if it doe, whether that will be sulphureous or saline or both.

Whether beaten Lime stone will in any close vessell by length of time & strength of fire, be[162] reduc’d to Lime <or whether Aire be necessary to its calcination.>

n. Enquirys & Tryalls about Insects & Spontearta (BP 26, fol. 90)

Enquirys & Tryalls about Insects & Spontearta.

Whether every vegetable being putrifyd will produce a distinct Insect.

Whether distinct Animalls will produce differing & determinate Insects.

Whether the differing parts of the same vegetable as the Leaves & blossomes, fruit, seed &c will produce distinct Insects.

Whether the <differing> parts of Animalls as <the> Brain, Blood, milke, Membranes &c. will doe the like.

Whether the Insects soe producd will be the same to appearance, have the same changes and metamorphoses <and also generate others> incident to them[163] as resembling Insects that are supposd to proceed from genitors of the same kind.

Whether Insects will be produced[164] in vessells Hermetically seald.

[155] followed by ‘or non’ deleted.
[156] followed by ‘salts’ deleted.
[157] replacing ‘if’ deleted. Eight words later, ‘when’ followed by ‘Lixivi’ deleted.
[158] followed by ‘which’ deleted.
[159] insertion in margin. Two words later, ‘sublime’ followed by ‘or’ deleted.
[160] followed by ‘diff’ deleted.
[161] followed by ‘well-beaten’ deleted. Six words later, ‘pressd’ followed by ‘&’ deleted.
[162] followed by ‘calcin’ deleted. The insertion that follows three words later written in margin.
[163] followed by insertion mark but no insertion. The next word, ‘as’, followed by ‘Inse’ deleted.
[164] followed by ‘b’ deleted.

Whether Insects will be producd in the exhausted Receiver, or other vessells whence the Aire is withdrawne & kept out.

Whether an Animall fed from the beginning with nothing but one sort of Insects, or the Body, whose putrifaction produced it, will thereby when dead afford the like Insects, or have that which it would naturally have producd considerably varyd.[165]

Whether in case Insects be produced in the Receiver they will have their motion as in the free Aire, notwithstanding that <other> Insects of all sorts[166] (except one) that I have tryd, will be renderd movelesse tho not kild[167] by the withdrawing of the Aire, and this is particularly to be tryd in the Eggs of Snailes, for I have found by Experiment both that those Eggs being carefully kept <in good mold> will hatch of themselves, and that snailes tho bred in the free Aire will[168] alone claim their motion in the exhaustd Receiver and if[169] Flies & Butterflies & gnatts will be generated there, which not[170] withstanding the exhausion of the Aire they will be able to fly. /fol. 90v/

Whether Froggs spawne will be hatchd in the exhausted Receiver, which[171] would be as probable a way as any I can yet think of to try whether an Animall endowd with Lungs, may by assuefaction from the very first, be brought to live without Aire.

Whether by mingling the juices of Herbs, or otherwise compounding vegetable substance[s] there will emerge upon the putrifaction of the mixture Insects of a compounde[d] Nature, or of a Neutrall Nature, or whether noe Insects at all will be producd.

Make the like Tryalls with[172] mixtures made of Animall & Vegetable substances, as of Blood and the juices of Herbs, to which sort may also belong Milk, Butter, Cheese, & severall kinds of Dungs, as that of Doggs fed only with bread &c.

Whether Eggs putrifyd will produce the same Insects as Herbs, and the spawne of fishes, & other viparous Creatures, as the Animalls themselves. The like may be tryd with the Eggs of silkwormes, Catarpillars, & other Insects.

Whether <a> digestion of[173] the matter to be putrifyd in a gentle heat will hinder the production of Insects, or will varie those that shall be producd.

Whether Insects themselves[174] as Worms, Catarpillars & others of the more juicy sort being well beaten into a Masse or Pap <this> will upon putrifaction produce Insects & whether of the same kind or others, and if any whether this second-brood, being handld after the same maner, will afford a third, and How <often>[175] this successe will hold, & in what creatures it will terminate.

[165] This paragraph appears in the margin.
[166] followed by ‘that I have tr’ deleted.
[167] followed by ‘with’ deleted.
[168] followed by ‘not’ deleted.
[169] followed by ‘Bees & B’ deleted.
[170] accidentally repeated.
[171] followed by ‘will be a way to try’ deleted.
[172] followed by ‘the’ deleted.
[173] altered from ‘digesting’.
[174] followed by ‘are’ deleted.
[175] replacing ‘many’ deleted. Seven words later, ‘what’ followed by ‘f’ deleted.

o. Queries about Gems (BP 27, pp. 331–2)

Quer[ies] about Gems.

In what region the Gem most abounds (or at least is found) as whether in North[ern] or South[ern] climats, in East[ern] or West[ern] Cont[ries].

In what soile the Gem is princip[ally] found, whether in mountains, hils, plains, vallys &c. Near or far from rivers or other water? Whether it commonly ly upon the ground, or beneath the surf[ace] of it, and if und[er] ground, at what depth is to be met with.

What are the qualific[atio]ns of the ground that environs it, whether wet or[176] dry, barren or fruitful, common or miner[al] Earth; and if mineral, what color, sent, taste, gravity <&c> it has; what menstruums wil or wil not work on it, and whether it will afford any thing by distillation; and if so, what.

What are the chief concomitans & circumstances of the gem as ‘tis 1st found, as whether it be found in Mines or Quarries.

Whether the womb (if I may so cal it) that breeds them, will, being robd, produce others and in what time.

Whether the Gem be usually found loos & entire, or partly inclosd in stone, or some other mineral, or at least growing thereto (as is usual in Cornish diamons) and which kind of Ston[es] & minerals the Gem is found in, or growing on. Also, whether it grows single or clusterlike: and, whether it differs in the place where ‘tis dug up from itself, when’t has been long in the fre air.

Whether there be any differing kinds of the proposed gem, and if any, how <many, and what they are,> What the fig[ure] of the gem naturally is, as whether hexagonal, as Christ[als] and Cornish diamons usually are; or polyedrical, & I have observd divers rubys to be; or of a gibbous form about angles, as many [sic] be seen in some kinds of granats; and whether the determinat fig[ure] belong to the whole gem, as in <the> Rubys newly mentiond, or whether it belong to the prominent parts of it, which has had conveniency to shoot into its natural shape (as I have div[ers] times observed in Chryst[als] or Christallike stones, who near their roots where they grew to the matrix, were of no regular figure, but had one in their body, and at their points. The like I have seen in many Amethists as they were digg’d out of the Rocks.

Whether the Gem do always, or almost always, grow pure and distinct in its kind, or do sometimes admit of mixtures and degenerations (as I have seen in a natural stone that was partly diamond and partly ruby; and another that were partly ruby and partly amerand[177] or Saphir, and a huge piece of chrystal, which near the apex of its pyramidal part was intensely green like an Emerald, and as the pyramid grew broader & broader, the color green more diluted, till at length it was not discernable.

Whether the Gem be naturally of one color, as Emerads, Granats &c. are thought to be, or[178] (or least sometimes) of variegated color, as Jaspers, Agats &c. some kind of bloodstons are oft observ’d to be; and whether, in case the whol gem be usualy of

[176] followed by ‘barr’ deleted.
[177] followed by ‘and’ deleted.
[178] altered in composition.

one color, the color be the sam in all gems of the sam kind, or som of them may be of a color differing from the generality of the rest (as there are white rubeys & white saphirs, and even in diamonds, besides the more usual variety, I have seen an exceptional stone as yellow as a Topaz, and another of a deep reddish color almost like an Estern Ametist.

What the hardnes of the Gem examind is, and by what ways its hardnes may be[179] estimated, espec[ially] in refer[ence] to other gems.

Whether the propos’d gem be a body with equal care divisible every way, as a lump of clay or dough, or have a grain like wood: For I find, that even Diamonds the hardest of known bodies, and wherein one would least exspect fibres may be easily enough split, if it be attempted according to the ducting or course of the fibres; whereas those that graid [?] diamonds assure me, that they cannot /p. 332/ cut them against the grain, and ‘tis a known thing amongst them, that in other cases, nothing but diamond will penetrate a diamond.

Whether the Gem propos’d is capable of being made to afford any odor by the most proper means of manifesting it.

Whether the Gem propos’d be fit to produce any peculiar sound in a convenient body.

Whether the Gem may be made to strike fire with steel or another gem of the same kind.

Whether the Gem may by friction, heat, or otherwise be made to shine in the night.

Whether the Gem have an Electrical vertu, and if so, how strong that is.

Whether the Gem wil be alter’d as to transparency, color or weight, by lying in water, or other liquors not corrosive, as we see it happens to the Oculus mundi, and probably to some other stones.

The Gem being weigh’d in water, what proportion it bears to water of the same bulk.

Whether the gem wil suffer any loss of weight by ignition; and if any, what proportion that decrement wil bear to the whole stone, by an ignition of such a determinate time.

Whether the Gem by ignition will loose al, or any part of it’s color, as it happens to most of precious stones; or wil retain it’s color in the fire for a long time; as I have observ’d some kinds of Granats to do after several ignitions; or wil have its color exchang’d, as [I] have observ’d a green stone turned red.

Whether the gem be dificult or easy to be ignited, and what color it wil have whilst tis actually so; that we may see how far the fire wil alter the native color of the gem; (as I have with pleasur observ’d, when for curiositys sake I brought some Emerands and other stones <to> ignite).

Whether or no the fire (if need be long continued & extended) wil alter the textur of the gem, & if it do, whether it wil calcine or vitrify it; and what degre & continuance of heat is requisite to do either of them; and whether, if the gem vitrify, it wil mix with glas & alter it; & if it calcine, whether the calx have any salt in it, and if it abound therewith; and what proportion in specific gravity the vitrum or the calx beares to the gem before it was expos’d to the fire.

[179] accidentally repeated.

What menstruums will, and what wil not, work upon the gem, either crude or prepard; and what magistery as to figure, tast, color, &c. wil be producd by the coalition of the particles of the stone with those of the menstruum.

Whether the color of the Gem proceed from the textur of the whole, or from a separate tincture.

Whether the gem be a meer stone, as Christals seem to be, or a more compounded body consisting chiefly of stone, but partly also of some metallin or mineral substance, which by a skilful management may be at least discover’d, if not separated.

Whether the propos’d gem may be imploi’d to turn some other matter into the like gem, or whether itself may be turnd into some other kind of Gem by being deprived of its own tincture, endow’d with a new one, or otherwise managed.

What are the medical & other vertus of the proposd gem, and how to be best discoverd & examin’d.

Whether or no in polishing the Gem care must be had to polish it, as is usual in diamonds, with the grain; or what are the best ways of cutting, polishing, setting, or otherwise advantaging the proposd gem.

What are the best ways of imitating or counterfaiting the propos’d gem in order to the discerning betwixt the counterfit & the true.

By what marks & ways of trial we may best make choice,[180] among the propos’d gems & estimat their goodnes in reference to several purposes, especially those upon whose account they are to be priz’d by the Jeweller, or may be useful to the Physitian.

p. Untitled heads concerning copper (BP 36, fol. 80)

Of the Differences between Native Copper and that which is melted out of the Oar.

Of the first Qualities of Copper, viz. Heat, Cold &c.

Of the Colours of Copper and particularly of that which comes from Japan.

Of the differing Colours that Copper exhibits in differing Menstruums.

Of the Colour that Copper imparts in Vitrifications.

Of the Colours Copper acquires by mixtures with other Minerals.

Of the Sound of Copper.

Of the Odour of Copper.

Of the Tast of Copper.

Of the Specific Gravity of Copper.

Of the Malleablenes, Ductility &c. of Copper.

[180] altered from ‘choise’.

Of the Fusiblenes of Copper.

Whether Copper be an Homogeneous Body.

Of the Analysis of Copper pretended to by Chymists.

Whether from Copper may be extracted any true salt.

Of the Vitriol of Copper and the wayes of making it.

Whether from Copper may be obtain’d a true runing [Mercury]? And of some cheating wayes of making it seem to afford one.

Whether from Copper may be separated, or otherwise obtain’d, a true sulphur? And of the way of making a disguis’d one. /col. 2/

Of a red Tincture obtainable from Copper by a peculiar Menstruum.

Whether from Copper may be obtain’d a [Tincture] especially so as to leave the Body white? And if so, of what colour that [Tincture] will be.

Of a surprising Effect of this last nam’d Tincture.

Of the white Body of Copper that would remain after the extraction of the [Tincture].

q. Inquiries concerning Valentine Greatrakes (BL 3, fols 33–4)

What Complexion Mr Gr. is of; whether Melancholy, Sanguine, Phlegmatick &c.

What Deseases he is, or has bin subject to; whether he be lean or fat; vigorous, or weak, & of what Age.

How long since, & at what time of his[181] life he first tooke notice of, & tryed the Impulse he speaks of to cure Deseases? and whether that were preceded by any fit of Sicknesse, or of Melancholy, or any Accident that might have any extraordinary Influence upon his mind, & in what maner he received his first Impulses?

Whether before he applys[182] himself to do a cure, he uses any Ceremony, or other words, or prayer; & if a Prayer whether he uses arbitrary words or some set Forme? and if the later what it is; As also whether whilst he is stroaking he imploy’s any peculiar Rites, or words, or doe, or doe not, use to give thanks when he has done. And whether he require that Patient to doe, or say any thing, before & after he has stroakd.

Whether he perform’s any wonders by barely applying his hand to the part affected, or must also rub it, & in case whether Friction be necessary, whether he make it light or strong, & how long he usually continues it?

Whether he can perform Cures, & remove pain’s when the Patients Cloths are on, or whether the immediate Contact of his hand be requisite.

[181] followed by ‘age’ deleted.
[182] followed by ‘his hand’ deleted.

Whether his left hand, & his right hand doe stroake with æqual efficacy; & whether the Contact of his Cheek, breast &c æqual that of his hand?

Whether his Gloves, Shirt, & Stockens that have bin worne immediately upon his flesh, be of æqual efficacy with his hand in the Cure of Deseases, or at least in the removeing of Paine; & whether, in case they be effectuall, how long their efficacy will last after his ceaseing to ware them; & whether the degrees or duration of their virtue will be encreasd if they be taken from /fol. 33v/ his Body when he is sweating, or at least more then ordinary warme.

What will be the efficacy of his spittle, & his Urine, & if they have any, how long it will last.

Whether his Urine be more effectuall when warme or cold. Whether its Sanative Vertue will be preservd longer if it [be] kept close stopt, or otherwise; & whether a little spirit of Salt, or Nitre &c. dropt into it, whilst it is yet fresh & sanative, will by changeing the Texture destroy or impair the Vertue; & whether if his Unaltered Urine be wearily distil’d in Balneo, the spirit, or the phlegme, or residence, or all or none of it, will retain a sanative Vertue.

What Deseases they are that Mr. G. cannot at all[183] cure, & among those which he sometimes cures, which are they that he succeeds best, & which he succeeds worst with. And among the former sort what Complexions, ages, sexes, &c. do the most favor, or disfavor his Cures.

Whether <upon> Mr. Gr. his Touch, or stroaking there ensue ordinarily, or at any time, any quick & manifest evacuation of peccant matter by Vomit, Seige, Sweat, Urine, or Salivation.

Whether Mr. Gr: his sanative power will reach to the cureing[184] or removeing pains in Horses, Doggs, or other Bruits.

Whether it be true that is affirm’d that the Effluvia of Mr. Gr. his Body are well sented, when he has imploy’d no propper meanes to make it soe.

Whether Mr. Gr. is able to cure any possess’d Person, or any Desease (if there be any such) produc’d by witchcraft.

Whether Mr. Gr. be able to cure Men of differing Religions, as Roman Catholicks, Socinians, Jews &c. as also Infants, Naturalls, or destracted Persons to whose recovery the faith of the Patient cannot concurre.

How many times it is usually necessary for the Patients to be touchd according to their respective infirmitys, & with what Intervalls betwixt those times. /fol. 34/

Whether the efficacy, or inefficacy of his Touch be alwayes proportionate to the greater or lesser danger, or obstinacy of the Malady, consider’d as Phisitians are wont to æstimate it.

[183] followed by ‘cure’ deleted.
[184] followed by ‘of’ deleted.

r. Topics for the History of Diseases (Sloane MS 2502, fols 1v–2)

Præliminary Topicks or Articles of Inquiry, in order to The History of Diseases.

1 What Climates are more Subject to give the Disease [As we see that the Scurvy is more frequent in the Northern then in the Southern Climates.]

2 What Countrys are only or chiefly upon the account of the soil, the most apt to breed the Disease, whether in the Natives, or in strangers. [As[185] Ireland does much dispose men, especially new comers to Fluxes, and Kent to Agues.]

3 What places in regard of the particular *situation* and other circumstances, do most expose men to the Disease. [As the sea coast usually makes men more obnoxious to the Scurvy then the Inland parts.]

4 What places are free, either totally, or <in>[186] great part, from the Disease, and upon what account they may probably be judg'd to be so. [As China is very seldom infected with the plague, which is also observ'd in divers parts of the East Indies; and in Scotland Agues are very unfrequent & in some part almost unknown.]

5 What places are observ'd to cure, or considerably mitigate the Disease, in Patients that bring it from abroad. [As Scotland is wont easily to cure men of Agues, as the air of Montpellier often does of Coughs and Consumptions.]

6 What Sex is most or less, or not at all subject to the Disease: [As women are more subject to convulsive affections then men, and less subject to the Gout.]

7 What age is most or less, or not at all subject to the Disease; [As old men are more subject to the Gout, and the stone of the Kidneys, midle-agd men to the Phthisis or consumption, children are most to the stone in the bladder, but not at all to the Gout.]

8 What complexions, or constitutions are most or least subject to the Disease. [As sanguine Persons are most subject to bleedings, Phegmatick to Rheums, & Coughs; Cholerick to Feavors, and sharp Fluxes, Melancholy[187] Persons to affections of the spleen to Hypocondricall affections, particularly Quartane Agues, &c]

9 What course of life dos most dispose or indispose men to the Disease. [As Guilders & Plumbers are often subject to Palsies & affections of the nerves; the makers of Ceruss to cholicks; sedentary men are far more subject to the Gout, then labouring men, or those that doe much exercise.] /fol. 2/

10 What kind of diet do's most or least, dispose men to the Disease or releive them in it. [As Salt Fish & powdered Biefe do's to the scurvy, which Oranges, and divers green herbs, besides scurvy-grass, do often cure seamen of; or at least much releive them. Thus in the Alps, and some of the Spanish Mountains, the Inhabitants are subject to great & unsightly tumors in their necks by drinking of snow water.]

11 What influence the season of the Year may have upon the Disease, either to breed, encrease, change, or cure it. [As quartans seldom begin, but in the Autumn, or winter, and frequently goe off, or turne to tertians in the springe; or in the begining of Summer. And Autumnall tertians doe oftentimes when the cold comes on, degenerate into Quartanes. And the Plague that rages in the summer, does often

[185] preceded by 'I' deleted in Locke's copy.
[186] inserted in pencil.
[187] Locke's copy has 'melancholick'.

remit much of it’s fatall malignity in the Autumn or the Winter; and not unfrequently degenerate into Diseases, of other kinds.]

12 What other Circumstances differing from those, mention’d already to the same purpose, may be observ’d about the Disease under Consideration. As, what Age, Sex, Climate, Soile, Complexion, Diet, course of Life &c. The Disease is more or less fatall, mischievous, or benigne. As ‘tis observ’d that the small pox is extreamly mortall in China, even slight[188] wounds in the head, are far more dangerous in Italy, then in England, or France, and so small hurts of the Leggs about Geneva, and Lusty labouring men such as Diggers & Hedgers rarely recover of Pleurisys. What Constitutions either single or successive of the seasons of the year. What great alteration of the Air, by great & lasting Raines, Winds, Droughts, Earthquakes, fiery Eruptions, great spots in the sun, vanishing, or reappearing Starres, Comets &c. did precede[189] or accompany the Disease; also whether it be a new Disease, or have been from the begining of the World, and even in this part of it, whether in case it be new ‘twas *introduc’d & propagated* by, or without manifest Contagion, whether it’s malignity encreases or lessens, by progress of Time, as many Physitians observe the symptoms of the Lues Venerea, to have been for some considerable time far milder then when the Disease began first to appear in Europe.

s. Untitled heads concerning flame and fire (MS Locke c. 42, fols 266–7)

1. Of the severall wayes of produceing flame by the sun beames & otherwise.
2. of the things that promote flames.
3. of the things that conserve flame.
4. of the things that hinder inflammability or actuall flame
5. of the severall things & wayes that destroy & extinguish flame
6. of Bodys capable to be inflam’d
7. of Bodys incapable to be inflam’d (as water, snow, Ice, Oyle of Vitriol Spirit of Salt &c.[)][190]
8. of the Quantity of the inflammable Ingredients requisite to make a body burne, exemplify’d in Alcole of wine mixt with water
9. Of the Quantity of an[191] inflammable Ingredient that will be preserv’d from burning by an uninflammable One (exemplify’d in the Sal mirab[ilis])
10. whether ingredients that are a part uninflammable may by Texture become inflammable.
11. what [sic] a body inflammable may by change of Texture cease to be soe.
12. of the duration of Flame.

[188] ‘the small pox… even slight’ missing in Locke’s copy.
[189] altered from ‘preceed’ in pencil. Locke’s copy has ‘Proceed’.
[190] bracket missing in original and here supplied
[191] squeezed in at end of line to replace ‘the’ deleted.

13. Into what bodys flame degenerates upon extinction.
14. of the sphear of Activity of Flame
15. Of the Tendency of Flame upwardes, & the cause of it
16. Of the usuall concomitance of flame with smoake
17. Of the simple Colours of Flame (whether naturall or artificiall) & their mixtures.
18. of the Luminous quality of Flame & its degrees.
19. of the Expansion of Bodys requisite to flame.
20. of the necessity of air to flame.
21. of the Opacity & transparency of flame.
22. of the Power to act that flame getts by blowing
23. of the flames of Lightning &c. and of their strange effects
24. of subterraneous flames both vanishing & lasting.
25. of fiery Meteors, particularly falling starres & the flames that breake out of Fountains in Yorkshire,[192] in Delphinam & Gesermas [?] part of France & the Mountains of Chile & Peru.
26. of the figure of flame,
27. of the[193] force of flame in Mynes, Granadoes &c.
28. of the Mediums by which flame will passe.
29. whether flames do add any real & durable substance to bodys expos’d to it.
30. of the Levity & weight of flame.
31. of the Recrements of inflammable Body’s, ashes & soot.
32. of the Odours of Flame
33. of the Minutenes requisite & sufficient to make Corpuscles concurr to compose a flame exemplify’d in Volatile gold in flames whereof Copper & Zinke are ingredients.
34. what [sic] a sensible heat be necessary to flame
35. of the affinity & difference betwixt bodys that are not only hot, that are only light & flame. /p. 267/
36. Whether the mixture like that of the Mountebankes or Confusion of Liquors can alone produce an actuall flame.
37. Whether there be flames that will really continue under water without being extinguish’d by it & whether the same flames, or some others would not burn without aire.
38. Whether Aire by any degree of agitation how high soever be capable of being inflam’d
39. Whether a great heat can be given by flame alone or by coles &c. without flame.

[192] ‘Y’ altered from lower case.
[193] followed by ‘forc’ deleted.

40. How great a part of a Combustible body may be suppos’d to be burn’t into flame, exemplify’d in Alcole of wine.

41. Of the difference betwixt the parte of flame as the upper & lower part of the flame of a Candle, & the Externall part which is Contiguous to the Aire compar’d to the Internall.

42. of the difference of Flames according to their Densitys.

43. of the Propogation of Flames as in the Smoake of a Candle, Gunpowder &c.

44. That Aurum fulm[inans] Yields a flame

45 Of the Tenuity of one Flame in Comparison of another.

46. Whether the beames of Light Trajected through colour’d flame as Spirit of Wine &c. will appeare colour’d upon Paper.

47.[194]whether the Sun & fixt Starres be flames or no.

48. Of the Mechanicall use of flame in furnaces. Ovens &c.

49. Whether any other fulminateing powder then that of gold, doe belong to flame when it kindles.

50. Of the Composition of Gunpowder, & the reason of its ingredients and their proportion, under which heads comes the Destillation of Gunpowder.

51. Of the chief Fuells Especially Oyle, Sulphur, Niter & severall destillations.

t. Queries about Damps (MS Lister 34, fol. 35)

1. Whether the Damps are observ’d to come at certain times of the year, and if they do, at what times?

2. Whether they have any[195] periodical returns?

3. Whether they[196] ever take fire of themselves, without any actually burning fire?

4. Whether the fumes, that come visibly[197] out of the mouth of the pit, will be lighted by a candle, or torch?

5. Whether, if a[198] flat piece of clean copper be held for a competent time over the mouth of the pit, when the fumes ascend, any blewish or greenish discoloration will be made on the surface of the mettal?

[194] altered from ‘48’.
[195] EL version has ‘are’.
[196] EL version here has ‘the damps doe’; later in the sentence it has a question mark after ‘themselves’ and continues: ‘without any candle, sparks or actually burning body’.
[197] inserted after ‘out’ in EL version.
[198] followed by ‘piece of’ deleted. EL version here has: ‘if a piece of a plate or any other flat piece of clean copper’. Later in the sentence ‘-ish’ is there added in each case.

6. Whether a light body of a convenient shape, being attached[199] to a string, and held over the mouth of the pit, will be carried up and down with a brisknes that may argue an unusual wind or current of vapors[200] coming from beneath?

7. Whether the Air or[201] Atmosphere within the grove be heavier, when ‘tis stuffed with the damp, than at other times? To be tryed with[202] a good Baroscope.

8. Whether upon the breaking of the fulminating damp there be perceived any[203] fume or smoak any more; and, if so, of what complexion and color that is? /fol. 35v/

9. Whether all[204] sorts of damps are visible? And, if there be any that are not so, whether those are found to be most dangerous and destructive, as being more subtile and consequently more penetrant[205] than others?

10. Whether, when they let down into a pit, filled with[206] noysom damp, a grate with store of kindled coals upon it, the fire will sometimes be quite extinguish’t, and that not only once, but twice or thrice?

11. Whether men dare attempt to work such groves or pits, when the damp or vapor is supposed to be[207] spent?

12. Whether the damp or vapor be most in dry or wet groves?[208]

13. Whether[209] the damp will lye and gather more and more in groves, that are not stirr’d in many years?

14. Whether the damp is esteem’d to destroy[210] by its own noisomenesse, or for want of Air?

15. Whether, where the damp is in any water-work, it[211] doth not chiefly follow, and lye upon, the water?

[199] EL version has ‘tyed’, following ‘held’ deleted.
[200] followed by ‘that’ deleted in EL version.
[201] These two words inserted in EL version, in which the next word, ‘Atmosphere’, is followed by ‘be heavier’ deleted.
[202] EL version has ‘which may be found by’ instead of ‘To be tryed with’.
[203] followed by ‘more’ in EL version, which lacks ‘any more’ three words later. At the end of this entry, the following is there deleted: ‘How long its vapor is ascending out of the mouth of the pit or grove’.
[204] Followed by ‘those’ in EL version, which has ‘be’ instead of ‘are’ four words later, and the following extra passage after ‘visible?’: ‘Whether those that are not all visible, are found to be the most dangerous and destructive, as being <subtler and> sharper than the other?’
[205] EL version has ‘subtler and sharper’ instead of ‘more subtile and consequently more penetrant’, and ‘the other’ instead of ‘others’.
[206] followed by ‘<a>‘ deleted. Four words later, ‘grate’ replaces a version of the same word with ‘a’ altered and blotted. Instead of ‘a pit….grate with’, EL version has ‘such pitts as <is> fill’d with noisome damp <a> grate with’, within which ‘is’ replaces ‘are’ deleted, ‘with’ is followed by ‘<a>‘ inserted but deleted again, ‘damp’ is altered from ‘damps’ and followed by ‘it’ deleted, and ‘with’ is altered in composition.
[207] ‘supposed to be’ lacking in EL version, where ‘groves’ and ‘pits’ appear in reverse order earlier in the sentence.
[208] At this point, EL version has a further entry, all but the final three words of which are deleted: ‘Whether it be there most, where there is most ore? near the ore?’
[209] followed by ‘it will’ deleted in EL version, which lacks the words ‘and gather more and more’ and has ‘for’ instead of ‘in’ before ‘many years’.
[210] EL version has ‘destroys’ instead of ‘is esteemed to destroy’.
[211] In EL version, ‘it’ is followed by ‘dot’ deleted and then by ‘lye not espetially upon the water’.