

# Texts and Documents

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THE VIRTUES OF THE CORTEX in 1680:  
A LETTER FROM CHARLES GOODALL TO Mr. H.

by

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CHARLES GOODALL (1642–1712) devoted his career to the affairs of the Royal College of Physicians of London and became its most articulate defender against attacks of seventeenth-century empirics and chemists.<sup>1</sup> In his *The College of Physicians vindicated . . .*<sup>2</sup> of 1676 he assailed the apothecary-empirics, particularly Adrian Huyberts for misrepresenting College licensing policies and the achievement of its members. Having proven his skill, upon request eight years later, he produced a historical account of the College and a history of the College's prosecution of recalcitrant practitioners.<sup>3</sup> During the last four years of his life Goodall presided over the College, having served previously at various times as Censor, Gulstonian lecturer and Harveian Orator. Goodall pursued an active career, although not all of his projects resulted in publications. A collection of his letters, some of which have been published recently by Kenneth Dewhurst, reveals the breadth of his medical interests.<sup>4</sup> These letters, written between the years 1680 and 1696, expose Goodall's projects pertaining to a survey in social medicine, an analysis of Sydenham's popularity among practitioners and requests for information on the harvesting, uses and effects of cinchona or Peruvian bark.

For a number of years Goodall had been preparing to write a monograph on cinchona. In these published letters, Goodall's appraisal of cinchona is lacking, however at the beginning of the decade he had explored the function of the drug in some detail in another letter. Within the manuscript division of the Bodleian Library, Oxford, catalogued as Rawlins Ms. C. 406, pp. 36–42, is a letter written by Goodall to Mr. H. in 1680.<sup>5</sup> It comprises six and one half folio-size leaves all composed in the same hand and is dated and signed by Goodall. In this letter Goodall explains some of his views on the treatment of agues (malarial fevers) with special reference to Peruvian bark or the cortex. Answering objections against the use of the cortex to treat agues, Goodall expresses some of the differences and agreements between his beliefs and those of his famous contemporaries, Thomas Sydenham and Thomas Willis,<sup>6</sup> and the famous

<sup>1</sup> For the fullest biographical account see Sir Humphrey Rolleston, 'Charles Goodall, M.D., F.R.C.P.', *Ann. med. Hist.*, 1940, 2, 1–9.

<sup>2</sup> The rest of the title is *against a pamphlet entitled the Cornerstone . . .*, London, 1676. Huyberts' pamphlet appeared in 1674.

<sup>3</sup> These two treatises are usually bound together. They are entitled: *The Royal Colledge of Physicians of London founded and established by law; . . .* and *An historical account of the Colledges proceedings against empiricks and unlicensed practisers . . .*, London, 1684.

<sup>4</sup> Kenneth Dewhurst, 'Some letters of Dr. Charles Goodall (1642–1712) to Locke, Sloane, and Sir Thomas Millington', *J. Hist. Med.*, 1962, 17, 487–508.

<sup>5</sup> I am grateful to the Keeper of Western Manuscripts of the Bodleian Library for permission to reproduce this letter. See for a description of the collection of which this letter is one item and their provenance H. A. Beecham, 'A notebook and a collection of manuscripts: originally the property of Dr. Charles Goodall', *Bodleian Library Record*, 1967, 7, 312–17.

<sup>6</sup> As late as 1725 Willis was considered an authority on fever. See Richard Blackmore, *A Treatise of the Spleen and Vapours: . . .*, London, pref. iii.

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Dutch teacher, Sylvius (Franciscus de le Bœe). This letter also sheds more light on the genesis of a publication attributed to Goodall.

Reference to a tract or essay entitled 'de cortice peruviano e ejus usu' by Goodall was made in the eighteenth century by Albrecht von Haller in his *Bibliotheca Botanica*, however this treatise seems to have disappeared, if it ever existed.<sup>7</sup> Haller dated the composition of this Latin essay to *circa* 1675. The contents of the Bodleian letter casts doubt on this date, for Goodall wrote in 1680 that he was hoping to prepare an essay on agues and the cortex 'if God continues life and health'.<sup>8</sup> He apparently never carried out this plan, although he lived for another thirty-two years. His later letters attest to his sustained interest in the project, but nevertheless the Bodleian letter remains the most comprehensive treatise by Goodall on the treatment of agues by the cortex.

The recipient of the letter remains unknown. Several circumstances lead to the possibility that Mr. H. was Adrian Huyberts, who was referred to as Mr. H. by Goodall in the publication of 1676. While Goodall adamantly refuted Huyberts' opposition to the Royal College of Physicians, at one point in the narrative he expressed appreciation for some personal favours received from Huyberts. Furthermore, Huyberts proved that he could establish a scholarly relationship with other physicians (Drs. Duhan, Duclos and Vallot) to whose tutelage he owed some of his knowledge of medicine.<sup>9</sup> Perhaps, the relationship between Goodall and Huyberts had ripened further after 1676, so that, four years later, the letter about to be discussed could have been addressed to Huyberts. Should this identity be established, the ramifications may be significant for the relationship between the Royal College of Physicians and the chemical empirics in this period.

Goodall's views on fever and its treatment by the cortex are especially intriguing since the theory and treatment of fever formed the factual context for Goodall's major premise that the Royal College of Physicians acknowledged seventeenth-century contributions to therapeutics.<sup>10</sup> It was the policy, he claimed, to accept candidates who had adopted the current theories of fever of Sylvius or Thomas Willis if a candidate could explain either one fully and its relationship to the Galenic doctrine.<sup>11</sup> Goodall concluded that these three theories displayed a number of similarities with respect to the cure of some fevers. Goodall's letter on the cure of agues, written a few years later, further documents his abiding interest in theories of fever and their treatment. Thus, we are less inclined to accept his reference to fever theories in defending College attitudes as merely an *ad hoc* expedient promulgated to win support for the harassed institution.

<sup>7</sup> Tiguri, 1771, I, p. 581. William Munk believed this might have been Goodall's Leyden thesis, but this proved to be a false conjecture also. A copy of Goodall's Leyden thesis, entitled 'de Haemorrhageis scorbuticis' is in the British Museum. Robert W. Innes Smith, *English Speaking Students of Medicine at the University of Leyden*, Edinburgh, 1932, p. 97.

Rolleston appears to have been in error in his statement that Robert Hooke made note of Goodall's work on the cortex in his Diary for December of 1680. I could find no mention of Goodall and this essay in the published version of Hooke's Diary.

<sup>8</sup> See below p. 297.

<sup>9</sup> Goodall, n. 2, p. 134.

<sup>10</sup> Goodall wrote in 1676: 'The College ties . . . not any men so strictly in their examination to the Hypothesis of the Ancients; . . . but instead thereof [who] solidly answers those Physiological questions by the Willisian or Sylvian principles, they do not condemn him; the only thing they fight against, being ignorance and mere impudent reviling of what they so little understand.' *op. cit.*, p. 55.

<sup>11</sup> Goodall, n. 2, p. 55 and Sir George Clark, *A History of the Royal College of Physicians of London*, Oxford, 1964–1966, vol. 1, p. 278ff and pp. 410–11.

Having terminated his medical studies at Leyden around 1670, Goodall had the opportunity to attend the lectures of Sylvius. A few years later Sylvius proposed a theory of fever which conflicted with the Willisian view that had been presented almost fifteen years earlier. A former student of Sylvius, Richard Gower, translated the book into English in 1675. Sylvius claimed that the seat of ague fevers was in the pancreas from which the feverish matter eventually moved into the blood to create the disturbance characteristic of these fevers. Willis, on the other hand, believed that these fevers were provoked by foreign matter introduced into the digestive canal and subsequently absorbed into the blood where the morbid particles spawned 'an inordinate fermentation'. Galen had explained that abnormal amounts of one or more of the four humours when accumulated in the blood produced a fever.<sup>12</sup>

Goodall remained noncommittal about these theories until challenged in 1680 to explain some objections raised against the use of the cortex, in addition to several questions about other treatments to use in conjunction with the cortex. Then, in reply to Mr. H., he revealed his disagreement with all of them and his preference for a theory similar to that of Thomas Sydenham.<sup>13</sup> Sydenham thought that an unknown constituent of the air (*a seminium febrile* for Goodall) entered the body and perverted the blood. The frequency of the ensuing crisis determined whether the fever became a quartan, tertian or quotidian. In addition, Goodall explained that each of the known types of agues developed in accordance with the amount of nutritious juice that had been altered.<sup>14</sup> Goodall dismissed the corrupt humours (Galenic) and the acid and other chemical substances (Sylvius and Willis) as being the causes of an ague. Rather, he reasoned, these were more likely the effects of fever. Sydenham proclaimed his indebtedness to Goodall for supporting his theories and dedicated his *Schedula Monitoria*, published in 1686, to him.<sup>15</sup>

The thrust of Goodall's letter was to defend the use of the cortex and to undermine arguments in favour of other forms of therapy like bleeding, purging and vomiting usually recommended to treat ague fevers. The primary objections raised in opposition to the administration of the cortex to cure an ague which Goodall refuted include: (1) that the mysterious manner of the cortex's effectiveness does not provide a sound theoretical basis for its application; (2) that the cortex works only by suppressing the fermentation within the blood and stifling the febrile matter instead of removing it from the blood; (3) that agues which may be initially cured by the cortex return within a few weeks or months; (4) that the unpleasant effects of the cortex are various and include headache, nausea and weakness.

Goodall did not urge a philosophical explanation for the action of the cortex, since other drugs were considered acceptable and effective, even though they lacked a satisfactory explanation of their mode of behaviour. To supply an explanation Goodall resorted to the foremost chemist of his time. Robert Boyle's demonstration of a chemical change produced by mixing a 'clear limpid spirit' with gall to form a separa-

<sup>12</sup> These theories are discussed in more detail in chapters six and seven of my unpublished thesis, 'The Circulation of the Blood and Medical Chemistry in England, 1650-1680', Baltimore, 1969.

<sup>13</sup> See R. G. Latham, *The Works of Thomas Sydenham*, London, 1848, vol. 1, pp. 39, 46, 79, 100. Sydenham discusses the fermentation of the blood but explains that he uses this term for illustration since it had been adopted by his medical peers, pp. 44-45.

<sup>14</sup> See below p. 297.

<sup>15</sup> Kenneth Dewhurst, *Dr. Thomas Sydenham (1624-1689)*, London and Los Angeles, 1966, p. 47.

tion of its parts, followed by a second exposure to another 'limpid spirit' which reunited these parts provided Goodall with the evidence to attempt an explanation of the cortex's behaviour.<sup>16</sup> By analogy Goodall reasoned that the cortex might react with the fever-provoking substance within the blood without leaving any products to be evacuated. Previously any of the various modes of evacuation were considered essential to a properly functioning febrifuge.

In answer to the second objection Goodall conceded that if the cortex only suppressed the fermentation of the blood it would not be a useful drug. Its use had shown that, in fact, the cortex promoted perspiration and acted as a purge,<sup>17</sup> to the extent that it sometimes required laudanum to suppress its purgative quality.

Those who objected to the cortex because it did not provide a permanent cure were precipitate in their condemnation, since even a temporary abatement of fever had obvious advantages for a weakened patient. Goodall's own experiences also led him to question the type of care given to a patient who had relapsed. He felt that the control of fever rested on more than a brief medicinal diet, but rather, required the careful and constant attention of the physicians<sup>18</sup> employing a host of treatments in response to the daily changes of the disease.

Finally, to the last objection that harmful and unpleasant effects evolved from medication with the cortex Goodall offered several challenging questions. How could the physician be certain that the drug and not the original fever led to such common complaints as nausea and vertigo? Why were so many patients relieved by the cortex without suffering these consequences? Had the disease been properly diagnosed and distinguished from other diseases which the patient may also have contracted, and which may have been the source of these symptoms?<sup>19</sup>

Goodall's recommendation of the cortex resulted in his subsequent denial of the virtues of bleeding, purging and vomiting to relieve agues. Of all these methods, emetics might still be employed, but Goodall, in agreement with Sydenham and Willis, downgraded a protracted regimen of all of these common depletionary methods.<sup>20</sup>

Goodall argued for replacing ancient methods of therapy when modern discoveries in anatomy, physiology and pharmacy so indicated. Contrary to the claims of numerous promoters all the therapeutic modifications were not dependent on the existence of chemical drugs. The cortex, a plant substance, more than any other drug, revolutionized the treatment of ague fevers. As a plant product the cortex came within the realm of Galenical drugs and offered the best counter example to those insisting upon the unique benefits of chemical medicinals. The action of the cortex was limited and its behaviour perplexed physicians, but like Sydenham, Willis and Goodall, they prescribed it for agues because it was effective<sup>21</sup> and provided a safe alternative to

<sup>16</sup> See below, p. 297.

<sup>17</sup> *Ibid.*, pp. 288–89.

<sup>18</sup> *Ibid.*, p. 300.

<sup>19</sup> *Ibid.*, pp. 301–2.

<sup>20</sup> *Ibid.*, p. 302.

<sup>21</sup> See for a comment on the popularity of cinchona: Rudolf Siegel and F. N. L. Poynter, 'Robert Talbor, Charles II, and cinchona a contemporary document', *Med. Hist.*, 1962, 6, 82–85.

Walter Harris in 1683 observed: 'The cortex is now as much the Prince of Plants, as Gold the King of Metals . . . in Quartan and Autumnal Tertions it is a remedy of greater certainty and specifick propriety, than perhaps physick was ever furnished with before, either upon those or any other accounts.' *Pharmacologia Anti-Empirica or a Rational Discourse of Remedies both Chymical and Galenical* . . ., London, pp. 168–69.

dangerous treatments such as venesection, purgation and the administration of emetics.

Goodall's letter which explains these points more extensively, is reproduced below. In transcribing the letter I have retained the original spelling and punctuation, but have expanded the contractions which, in the original, would have made the letter unduly difficult for the modern reader.

An answer to Mr. H. letter in the defense of the cortex Peruv. against several objections made against it, As also an Answer to some questions relating to the seat of Agues and their cure.

Anno Dom; 1680.

I thank you for your very ingenious letter, wherein I observe many acute and smart objections mustered up against the use of the Cortex, to which I am sorrie that my present occasions will not give me leave to return so full and satisfactory an answer as you may hereafter expect (if God continues life and health) intending not only a treatise of Agues in particular, but a full and general History of the Cortex from its first original in the West Indies.

**Object**

- 1: Your first objection against the use of the Cortex is the difficulty of solving the manner of its operation.

**Answer**

- 1: Suppose there was no probable account to be given to an inquisitive Naturalist from any hypothesis hitherto known as to the manner of the Cortex's operation; should we therefore dispute the usefullness, virtue and goodness of this medicine, though we daily see the wonderful and extraordinary cures it performes? We may as well (upon the same principle) deny the Load-stones attracting iron; and flux and reflux of the sea, because great philosophers could hitherto assign no satisfactory causes of these: we may from hence deny the aires commixing with the blood; the Chyles from passing out of the Intestines into the lacteal vessells, because the passages are so abstruse that the most accurate and industrious Anatomists could not hitherto discover them: we may as well dispute, why women should at such an age have their menstrea, and at such an Age leave them, or why they should have them at all, and deny matter of fact; because we see all or at least most other females do propagate their species without any want of them.
- 2: If this was a sufficient reason to deterre any ingenious physician from the use of the Cortex, the same might make him as cautious in prescribing most of the bitter and strengthening plants, which are highly valued for some successful cures of Agues, dropsies etc. I meane such as Gentian, winter Cinamon, Centaury, Chamomell flowers, Pynque-foyle and herbs of that classis. Now he that can satisfie me how these plants can cure without any sensible evacuations; How steel, coraill, pearl, etc. can cure splenetick, cachectick and ill habitts of bodies; How specificks as single poeony, Mistleoe of the oak, *Cranio humanum* etc. do cure the distempers they are appropriated to, may as easily solve this difficulty proposed of the Cortex's curing agues without any sensible evacuations.
- 3: I would gladly know why the texture of the Aguish matter might not be so altered by the subtle parts of this generous remedy, so as to reduce it to its native form and figure, whereby it might be rendered incapable of prejudicing the blood as well as unnecessary to suffer a discharg by any evacuation; And that because we can manifest by unanswerable experiments, that upon mixing a few drops of a clear limpid spirit with gall (when pure and sincere) it shall immediately cause a separation of white and purulent parts (like well digested matter in wounds) or which (it may be) we call morbifick matter in the blood; And upon dropping some small proportion of another

as pure and limpid spirit, it will again resorbe the fore-mentioned matter and recover its pristine form and colour the like experiment hath long before been shown to several eminent physitians by the Hon. Mr. Boyl, but with this difference that all his liquors thus used were limpid.

- 4: But to satisfy you more particularly about my thoughts as to the cause of Agues and the manner of the Cortex's operation; they are thus in short—Agues (when Epidemical) derive their original not from any vitious humors contained in the blood or in any particular focus or minera of the body (those Humors being generally the effects and not the causes of these distempers and generated in the masse of blood inter *singulos paroxysmus*) but from a *seminium febrile* conveyed into it from the Monosphere, whereby part of the nutritious juyce is perverted; which when it arrives to such a proportion as to be burdensome and offensive to the blood, it breaks forth into what we call a paroxysm. And accordingly as this *seminium febrile* doth pervert more or less of this nutritious juyce, so it produceth those seemingly different distempers which we call Quotidian, Tertian and Quartane Agues; which of old now unhappily believed to proceed from different excrementitious humors locked up in several of the lower viscera and moved (by I know not what instinct) at certain times and seasons when the different paroxysms of these distempers did use to appear. But now if my Hypothesis as to the cause of Agues be true, tis not difficult to assign a probable reason why the Cortex should cure one ague as well as another, which I find very difficult to be performed either by the Galenical or Willisian hypothesis, they both asserting these distempers to proceed from excrementitious humors or vitious affections of the blood of a very different and contrary nature, which they call choller, phlegm and melancolly; or else an acrimonious, acid, or austere disposition of the blood, whereby tis difficult to conceive how one and the same remedy should so successfully cure the several species of Agues proceeding from different causes. But by my Hypothesis this is plain, for if the different species of Agues do proceed but from one and the same efficient cause, viz. the *seminium febrile* derived from the aire; but from one and the same material cause, viz. the perversion of nutritious juyce differing only in degree and quantity, tis no wonder why one and the same medicine should as happily cure the one as the other Ague. But to discourse particularly as to the Cortex's manner of operation, I do suppose that the Cortex doth contain in some of its constituent principles those active parts, which are as destructive to the *seminium febrile* as Alkalies are to acids, whereby being conveyed into the masse of blood and insinuating itself into the pores of this hostile matter, it doth by the contrariety of its parts alter its morbifick texture, and thereby wholly disarme it of its febrile virulency, by which means tis rendered inoffensive to the blood as well as incapable of perverting any more of the nutritious juyce. But this is not all the excellency of this noble and generous plant, it appearing from its rough and grateful bitterness as well as from its admirable effects one of the greatest medicines we are Masters of to strengthen the tone of the stomach, to store its native ferment, to impregnate the Chyle with active and fermentative parts, whereby inspiring the impoverished vital liquor with a noble and lively ferment, it regains its native vigour and activity and performs all its operations as when in its most flourishing state.

Object

- 2: Your second objection is this, that the Cortex performs its operations only by suppressing the present fermentation of the blood and stifling the febrile matter therein, that it may be supposed like muddy beere or wine obstructed in its fermentation.

Answer

- 1: If this were the manner of its operation, I had much more reason to oppose the use of it then defend it. But when I consider that this objection is not only founded upon a mistaken notion of Agues (from whence indeed most errors in our facultie proceed, our curative indications in severall diseases owing their original to the fanciful opinions of some ingenious physitians and philosophers more then to their faithfull

observations) but upon an egregious ignorance in the manner of the use and operation of this Cortex, though prescribed according to the old or new method of using it. For according to the ancient practice of directing it, twas usually given 2 houres before the cold fitt, the patient kept close to bed and in the declination of the paroxysm a plentiful sweat appeared and continued for some time; by which means tis probable then that the more subtle effluvia of the Cortex insinuating into the blood and commixing with the febrile matter, might fitt and adapt it for its critical discharge by sweat; And as for the new method of using it (which hath been of giving a dose once in 4 hours between the fitts) it hath given considerative physitians so little suspition of stifling matter, that it hath rather given them trouble to find out propper and adequate remedies to prevent its purging. So that I know some persons (though in health) who can never use it in *specio* without purging them, unlesse it be mixed with some opiate to prevent that inconveniency. Wherefore tis very improbable that the Cortex should obstruct or stifle the Aguish matter either in the *primae viae*, or in the blood; because in the former there is a discharge by stool, and the later by sweat, both which may be esteemed the critical discharges of morbifick matter. But to put this question out of doubt, I can assure you that I have more than once given this remedy to women lying in without obstructing their lochia, which it must necessarily have done, had it procured those stifling and obstructing effects which you object; nay more than this I have cured the Jaundice (which I hope will be allowed to proceed from obstructions) when complicated with an Ague by the repeated use of this bark. And if the old observation be true that all bitter remedies are opening, I am sure that this must not be excluded out of the number.

- 2: The cortex is so farre from suppressing the fermentation in the blood, that tis rather to be esteemed a most proper and generous ferment of Natures preparing to activate and enliven a weak and impoverished blood, as yest or eggs do dull and heavy leaven. Which notion seems probable not only from the admirable effects and alterations which it makes and produceth upon humane bodies, but from the form of it which reduced into a fine and subtle powder or mixed with syrups etc. further we may observe it growne light and porous like flower wrought up with yest and when mixed with wine, beere, etc. it causeth them to froath and (as we call it in English) to laugh or worke.
- 3: If the Cortex did cure by suppressing fermentation etc. I cannot well understand how it should cure the forementioned distempers (as well or better) being exhibited between the fitts, when there can be no probable suspition of any preternatural fermentation in the blood. Wherefore it seems to me more reasonable to believe, that it cures by destroying the *seminium febrile* before mentioned, whereby the generation of any Aguish matter in the blood is altogether prevented.
- 4: If the Cortex performed its cure as you assert, then it must necessarily produce ill effects upon the faculties of the mind and functions of the body; the animal must be clouded, the vital rendered debile and infirme, the natural incapable of performing their separatory offices through the various colatures of the body which is so notoriously contradicted by matter of fact, that every one who hath been a diligent observer of the succeſſe which hath attended the exhibition of this Cortex cant but know, that the patient's hereby have grown of a more quick and lively apprehension of mind; the respiration hath been rendered more free and easie, and the pulse (which before was both weak and confused) hath been restored to a more strong, even, and natural state; And as for the remaining functions of the body, nothing is more plain, than the lost and depraved appetites have been hereby recovered to their due tone and temper, a good digestion obtained, whereby the assimilative faculty hath so well performed its office, that the blood hath been soon recruited and restored to its native strength. Nay that which is very observable, the urine which before appeared high coloured then thick and turbid, upon the use of this medicine hath in a short

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time regained its natural colour, consistency, and hypostasis; which I conceive as difficult to explain if the Aguish matter remained in the blood, and rendered it thick and turbid, as the depuration of muddy beere or wine without a fresh inspiration of some propper and active ferment. In short I shall conclude my answer to this objection with the observation of a young lady severely heated for 6 or 8 weeks with an Autumnal tertian, notwithstanding her having taken 2 or 3 vomits and other evacuating physick during this distemper. I found her reduced to such a degree of weaknesse, that she could neither go nor stand, her stomach so exceedingly debilitated that she could retain no diet, but almost as soon as down, poured up again; her pulse very weake and low, and all the functions of her body much out of order. However upon consideration of the great and admirable efficacy of the remedy to be used, I passed the following prognostick, that in case this gentlewomen lived but 3 daies after the exhibition of the Cortex (which was given in decoction) there were hopes of her recovery, and though twas probable she might vomit up her first dose, yet I had reason to hope the rest would be retained, when the weakened tone of her stomach was a little strengthened by this admirable stomach medicine; which in truth fell out according to my opinion, for after she had vomited up the first dose of her remedy with some crude and viscus phlegm, she retained the rest, obtaining daily an increase of strength and appetite, so that at the weeks end she could walk about her chamber, and in a fortnight went well to church, and so continued without any relapse by repeating this remedy at due and propper times, preserving hereby the strength upon her blood, which was at first impressed by the use of this generous and noble medicine.

Ob.

- 3: Agues that seem to be cured by the Cortex do often returne presently or the Autumn following, which causeth some Doctors to protest against its use, as that which lays a foundation for Agues many yeares after.

Ans.

- 1: To the first part of your objection I return the following answer. Suppose that the Cortex did never cure longer than a fortnight or 3 weeks time yet by its repetition health might as oft be obtained as a body was attacked, were it not therefore a valuable remedy? especially considering that when the Epidemick constitution of the air altered, which favoured the production of Agues, these distempers are then usually cured without physick. I have seldom met with any so indiscreet as to quarrell with their diet, or dispute the goodness, safety or suitableness of their food to nourish them, because it cant preserve them from hunger, nor maintaine their strength for months or yeares, without the daily and repeated use thereof. Why then shall we esteem the medicine as unsafe or not valuable, which will preserve us in health 14 or 20 dayes, and by its repeated use continue us so, if discreetly administered by a judicious hand.
- 2: Tis true many patients who have taken this remedy have relapsed, but these relapses have not proceeded from any deficiency of the Cortex in not curing, but from some neglect in the physitian or patient as to the due manner of using or taking it. For tis not enough for the physitian to exhibite such a proportion of this medicine as is sufficient to exterminate the *seminium fibrile* out of the blood and thereby restore the sanguine masse to its native vigour and temper, which is a reall security *ab intra*; but there must be a fresh inspiration of the blood with the same ferment, whereby its first impressed strength being maintained, the blood may be preserved from any Aguish attacks *ab extra*, which tis difficult to secure against without the repeated use of this generous Antidote. For though tis true, that the patients blood is freed from this *seminium febrile* (which perverted the nutritious juyce and thereby generated what we call Aguich matter) by the first exhibition of this medicine in its due quantity. Yet as long as we live upon aire, we cannot secure upon ourselves from the *seminia febrilia* being afresh conveyed into our blood, untill the Epidemick constitution of the aire comes to be altered, or our blood by repeated impregnations so strengthened

that it will admit none of these febrile parts to commix with it. I remember the same objection is taken notice of by the Honorable Mr. Boyl in his Considerations of the usefulness of Natural Philosophy, who there returns this answer. Besides that it may be often very beneficial to a weakened patient to have his fits put off, the physitianthere by also gaining opportunities to employ strengthening and preventing remedies. Besides this I say, if you will credit the great person Sir Kenelm Digby, it is rather the patients or doctors fault than the medicines, if the disease returns for having purposely consulted about this objection against the use of the Cortex *febrifugus*, He solemnly assured me, that of betwixt 20 and 30 persons that He had himself cured of Quartans by this remedy, not so many as had fell into a relapse; And in confirmation of this, I am able to produce twenty for one, who can be brought to the contrary, who have been happily and successfully cured (without relapse) by the use of this Cortex, if discreetly and judiciously prescribed.

As to the second part of your objection, viz that several eminent physitians have protested against its use, etc. I returne the following answer:

- 3: That I have great reason to suspect, that those eminent physitians discourse against the use of the Cortex from theoretical prejudices more than practical observations (which is very unmanly and disingenuous) especially considering that according to your own theory and practice they have rendered these distempers the *ludibria medicorum*; which appeares from the writings of the most eminent Galenists, who in their severall prognosticks of Agues do honestly confesse that Autumnal Tertians have proved mortall to many, that Quotidians being generated of a pertinacious humor are dangerous, and do often precipitate the sick into ill habits of body, as dropsies, Apoplexies and the Quartans do often continue not only for many months but yeares, and if inveterate are rarely cured till the spring following and if complicated with any great affection of liver or spleen do usually hurry patients into a deadly dropsie or inveterate scurvy, upon which account the old piece of poetry was framed. *Hydrops, Quartana, Medicorum, scandala plana.*<sup>22</sup>

And upon the same account some of the most ingenious of our modern physitians have not only called the Ancients theory into question as highly dissatisfactory to inquisitive men, but their very practice as being unhappily founded upon an erroneous opinion, ingenuously confessing to the world, that the best remedies made use of by the practice are so farre from answering their curative indications, that they render these diseases more incurable. The learned Dr. Willis in these cases thus expresseth himself; *In plerisque pharmaca quovis modo cathartica, centies licet repetita, nihilum perficerunt; quibus allibus insederat labes, a remediis excogitatissimis prototum Autumnum usurpatis, aegrolī ne quicquod levaminia recepere.*<sup>23</sup>

Ob.

- 4: Some patients complaine that the Cortex leaves an ill tincture in their blood and in confirmation of this opinion give instances of some, who have used it and though cured of their Agues, have had uneasinesse, illness, pains and the like scorbuticall symptoms attending them, which by vomiting and purging for three weeks were cured and they thereby grow healthfull and briske.

Ans.

- 1: The complaints of a few will beare no ballance with the comendations of many, but as for patients attributing ill affects to the use of this noble and innocent medicine; tis no wonder, yea very pardonable, seeing men that should be wiser (I mean Physitians and Philosophers) do so readily assign *non causa per causa*; For would they be so considerative and ingenuous as to distinguish betwixt the symptoms

<sup>22</sup> 'Dropsy and the quartan fever are clear stumbling blocks of physicians' or more freely 'Dropsy and quartan cause doctors to stumble'.

<sup>23</sup> 'In most cases cathartic drugs of any kind, even though repeated a hundred times accomplished nothing; in these cases the defect had settled in more deeply and the diseased did not receive any mitigation from the most sought out remedies used for all autumnal fevers.' [My translation.]

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produced from Agues, which are the natural effects of them, and what are procured by this medicine, they might soon solve the difficulty, the first being what I mentioned in the prognosticks of Agues taken out of their own books, the later such as you may find in my 4<sup>th</sup> answer to your second objection. But besides this, I would fain know how persons in health can take large and repeated quantities of this medicine without any other inconveniency, but a better appetite and digestion? how sick and weake patients can be so soon restored to their health and strength by the use of it if it leaves such an ill tincture upon the blood, and produceth such scorbutical affections as you mention; against which very symptoms, I am bold to say it, tis an Antidote of no mean value. But to deale more ingenuously with you in this objection, I will confesse to you that I myself have more than once known the Cortex given and often repeated, where the forementioned ill effects have been complained of. But then it hath ordinarily been in one of the following cases:

1. The medicine hath been given to those who have had their Agues complicated with other distempers, or else accompanied with a vomiting or loosenesse, by which means the blood hath been either loaded with morbifick matter caused by other diseases, or weakened and impoverished by the forementioned evacuations (which have been the true causes of the symptoms you enumerate) and so the vertue of the medicine eluded that few or none of its salutiferous parts have been communicated to the blood upon which account most of the cures thus obtained have been such as we call shattered or imperfect cures.

2. The medicine hath been given to patients kept close prisoners to their beds and followed with cordiall medicines, whilst they were in the use of this, by which means the blood hath been impetuously hurried into their Heads, occasioning violent Headaches, Lethargies, Palsies, Convulsions, etc. or put into such a disorderly motion, as it could make no due or natural separation in order to its own depuration, from whence have often proceeded uneasinesse, illness, pains, and the like scorbutical affections.

3. The medicine hath been exhibited to such as have had a great accumulation of vitious humors in the prima viae; or have been very severely attacked with this disease at first, and ill managed in their fits; or else have had this distemper long continuing upon them; or suffered it often to returne, if at any time cured; By which means the blood itself being loaded with Aguish matter not duly discharged by its natural crisis hath become dispirited and its assimilative faculty so weakened, that an opportunity hath been gained for the production of a great load of morbifick matter in the blood, from whence obstructions, Jaundice, scurvy, dropsie and the like diseases derive their original, with the very symptoms you mention, and many more. But these are so farre from being procured by the use of the Cortex Febrifugus, that had it been timely and rationally exhibited, it might have secured against all the forementioned symptomatical diseases. Now in some or most of these late mentioned cases, I doubt not but repeated vomiting and purging will be indicated, as well as in that you have acquainted us with. Your objections being as I hope thus fully answered, I shall make the short reply to the questions proposed, especially considering that there is some coincidency between the one and the other.

**Quest.**

1: Whether evacuations by bleeding, vomiting and purging would not render the use of the Cortex more safe and carry off any ill humors in the blood, etc.?

**Ans.**

These evacuations are so farre from rendering the use of the Cortex more safe, that they very much weaken and enervate the vertue of this generous remedy, and are therefore really contraindicated, where the Cortex is given: Besides Agues (not deriving their original from any vitious or excrementitious humors in the blood, but

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from a *seminium febrile* perverting part of the nutritious juyce) do indicate no evacuating medicines, and that because the material cause of Agues viz. the nutritious juyce provoked is discharged in the declination of the paroxysm by a critical sweat; and the efficient cause viz. the *seminium febrile* is exterminated by the Cortex, whereby the blood is not only freed from the morbifick matter, but speedily reduced to the same disposition and temper it was in before the Aguish assault. But these are not the only reasons which made me cautious of using evacuating remedies in these distempers, but partly my observation of patients falling into Agues speedily after a *Cholera morbus*, and others after bleeding and repeated purging, though prescribed in inflammatory diseases, which certainly they could not have done, had these diseases proceeded from any ill humors in the blood, Others I have known, who to cure their Agues have taken vomits more than once and purging medicines 5, 10 or 12 times, but to so little [*sic*] advantage that their Agues have grown more severe upon them, and they then glad to lay aside their prejudices, and at length to be cured by the Peruvian bark; and partly the observations of some of our judicious modern physicians, who have assured us that these evacuating medicines are very pernicious in Agues, to which purpose Dr. Willis whom I before mentioned declares that in most Patients *pharmaca quovis modo cathartica, centies licet repetita nihilum profecerunt*; the like Dr. Sydenham hath observed in the following account:

Intermittentium Autumnalium curationem non sine ingenti discrimine per catharsin tentari, praesertim vero per phlebotomiam, frequenti nimis observatione jam olim didici. Etenim in Tertianis (maxime si [ea] constitutio admodum fuerit epidemica) hac methodo sanandis, nisi Chirurgi gladiolus eodem ictu quo venam pertundit, ipsam etiam Febrem confodiat, dictae Febres, etiam in vegetioribus et Athletice caetera valentibus, nonnisi longo temporis tractu expugnari se patiuntur. In provectionibus autem, diutinum Febris cruciatum tandem etiam mors exceptit, [. . .] Quartanariis vero in tantum obest phlebotomia ut, Juvenes qui a morbo alias intra 6 menses fuissent liberati, per 6 adhuc alios ab eodem detineantur: aetateque provectiones, qui, nisi sanguinem detraxissent, intra annum poterant sanari, morbum etiam ultra statum illud tempus alere periclitantur, ac denique ab eodem victi succumbere. Quae de venae sectione jam dixi, levi operâ ad catharsin possunt transferri, nisi quod haec non usque adeo pernicioosa sit, nisi crebro repetita.<sup>24</sup>

But in case there be any indications for a discharg from the late mentioned causes, I judg vomits the most propper, and that not only because they empty the *primae viae* as well or better than other evacuating medicines, but because they more frequently cure Agues if given upon the first attaque of them, and a few houres before the paroxysm; which I conceive not so much to proceed from the discharg of the febrile matter, as from the alteration that is made upon the *seminium febrile* by the violent concussion of the parts and as it were churning of the blood, and it may be frights may cure these distempers much at the same rate.

<sup>24</sup> ‘. . . the attempt to cure autumnal intermittents by *catharsis* is highly dangerous; the worst form of *catharsis* being bloodletting. Frequent experience has told me this. In the tertians in question (especially if the constitution be epidemic) that we attempt to cure by bleeding, your lancet must cut the throat of the fever with the same stroke that pierces the sides of the vein; otherwise, even with the youthful and athletic, it resists for a great length of time. In old subjects, also, the disease distresses and continues. With these last, however, it is death that succeeds to it: the immediate forerunner being deadly inflammation of the tonsils, described above. Besides this, venesection hastens those other symptoms which have been spoken of as either the concomitance of autumnal intermittents during the period of their decline, or as the *sequelae* after their termination; whilst in quartans it is so pre-eminently prejudicial, that youths, who might otherwise have got rid of the disease within the first six months, have been kept ill half a year longer by the bleeding. As for old men, who without venesection might have been cured within the year, they run the risk, not only of keeping their complaint for a still longer period, but also of, eventually, dying of it.’

Translation appears in ‘Medical Observations concerning the History and the Cure of Acute Diseases’, in R. G. Latham, *The Works of Thomas Sydenham*, London, 1848, vol. 1, pp. 82–83. See a similar passage on p. 18 of vol. 2 in a Letter to Dr. Brady in 1679.

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### Question

Why sack and the like generous liquors are used in Agues?

### Ans.

To strengthen the assimilative faculty of the blood, by which means there cant be perverted so great a proportion of nutritious juyce; nor can the *seminium febrile* so readily fixe any hostile parts upon it; and if it should admit of any, they are sooner excluded by urine or insensible transpiration.

### Quest.

3: Whether the focus of Intermittents be in the blood or in an effervescency of the Intestines?

### Ans.

3: I doubt not but the *minera morbi* is in the blood and circulates with it into all parts, being hostile to none but the nutritious juyce, which it gradually perverts to such a proportion as makes it burdensome to the whole masse, from whence proceed the several symptoms of Agues, which hereafter I may have occasion particularly to explain. But for the Aguish ferment to have its seat in the Pancreas is as inexplicable to me as the Liver, spleen, mesaraick vessels or any of the lower viscera and it; may be more then some of the last mentioned. For though this febrile matter or ferment may be lodged in the Pancreas and from thence have its passage through its ducts into the duodenum, yet tis scarce intelligible, why it should not have its figure or texture altered by the com-mixture and effervescency there fancied? Or why it should not as well or better be carried through the Intestines permanently, then insinuate itself into the abstruse and subtle pores of the lacteall vessels, which probably adapted to the reception of nothing aliene and offensive, which undoubtedly these morbifick effluvia will be allowed to be? Besides how shall this ferment be a new generated and transmitted to its focus, if all be discharged in every fitt? And by what instinct shall it move upon each repeated paroxysm? Why occasions it no tumor in the glands? nor impedes the circulation of the blood? And why may not food or physick that is stiffe and viscous close up and obstruct this pancreatic pore and then our fitts are cured? But no more of this till time will permitt me to examine all that hath been said for this opinion by its learned Author, whom I shall ever honor for his most excellent and usefull works, though his notions and mine do not in all things correspond. Thus sir I have given you my present thoughts in answer to your very ingenious letter, for which I must honor you, though I dissent from you and ever own myself

your obliged and devoted servant  
Charles Goodall