

**Adhesions, or accretions of the lungs to the pleura, and their effects on respiration considered ... in a letter to Dr. George Baker / [Malcolm Flemyng].**

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Adhesions, or Accretions

OF THE

LUNGS to the PLEURA,

AND THEIR

EFFECTS on RESPIRATION  
considered,

BOTH WITH

Respect to THEORY and PRACTICE,

IN A

LETTER

To Dr. GEORGE BAKER,

Fellow of the Royal College of Physicians in  
London, and F. R. S.

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L O N D O N:

Printed for T. BECKET and P. A. De  
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1474



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A

## LETTER, &c.

I HAVE often wished, learned Sir, that a greater number, in our profession, of such as have been for a considerable time engaged in extensive practice, would leave behind them some marks of a commendable zeal to improve their art for the good of mankind, than at present do. I mean not that they should publish systems or large treatises. This would be requiring too much. And perhaps we have too many of those already. But methinks there are very few practitioners of large experience, who have not ob-

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served

served several things within their own sphere, worthy of being communicated to the public, which are not to be met with in books most commonly known, or not set forth so clearly and fully as they ought to be; and which might be drawn up for the press with no very great labour. Medicine, like other arts, will always be capable of further improvement. And this is at least one of the most certain and speedy ways of improving it.

Our late great physician, the celebrated MEAD, hath left us a shining example of this public spirited, and truly charitable disposition. Very few physicians ever were engaged, for so many years together, in so general, and so laborious a practice. Yet he could find leisure from time to time to publish, and republish with improvements, elaborate and useful treatises, both theoretical and practical: And at length crowned the whole, by  
printing,

printing, for the good of posterity, his highly valuable *Monita & Præcepta Medica*.

Upon a principle of this kind, however cramped both in ability and opportunities, I ventured above twenty years ago to increase the number of authors in our profession; and have published, at different times, several small tracts on such parts thereof as I was best acquainted with; by the publication of which I apprehended it was most in my power to be useful to society. My Essays having been well received both at home and abroad, and, which I value myself not a little upon, in a particular manner approved by you, I go on with the greater chearfulness in the same route; and send you my thoughts on a subject neither trite, nor unperplexed with controversy; a subject which in the course of my reading I have not found so closely canvassed as I think its

importance deserves. I wish my manner of handling it may please you as well as my other Tracts have done. I can assure you pains and attention have not been wanting on my side. Give me leave then, Sir, without any farther preamble or apology, to proceed to my purpose.

There are two opposite opinions amongst Physicians concerning the effects which Adhesions or Accretions of the Lungs to the *Pleura*, so often found on opening dead bodies, may have in Respiration. The one, at the head of which we shall place the late celebrated *Boerhaave*, maintains that under certain circumstances they create *Dyspnæa* or *Asthma*, to wit, if they are broad, and join together large areas of the surfaces of the lungs and pleura. The contrary doctrine is held by his illustrious scholar, the great physiologist of our times *Baron Haller*; whose authority in a point of this kind is not less to be regarded;

garded; as he has laboured so assiduously and successfully in Anatomy, and the animal œconomy; and has made so many, and so important improvements on his master's system. He denies that any such adhesions can in the least contribute to impair respiration. See his *Elementa Physiologiæ humanæ*, Vol. 3. p. 132.

It were to be wished that this controversy could be clearly and fully decided, as it concerns practice more than one may at first view imagine. Suppose, for example, we are treating a person labouring under a difficulty of breathing, which obstinately resists the most powerful remedies in common practice, if such accretions, as we are considering, can be nowise instrumental in creating, or aggravating this disease, in that case we are to pay no regard to them at all; nor trouble ourselves whether they exist or not; but direct our curative views quite another way. On the other hand, if they sometimes

times create, or even increase and heighten dyspnæa in co-operation with other causes, then we must go on with more circumspection; and not insist too obstinately and vehemently upon remedies directed against other supposed causes of the urgent symptoms, lest, while we are combating non-entities, we should harass our patient, not only unprofitably, but to his detriment: and we ought to join sometimes with other remedies some means calculated against the bad effects of such accretions, if means of this kind are to be found.

I am far from presuming to stand Umpire between two such great Names; but only propose in this paper to set forth the arguments on both sides, in the fairest and most impartial manner, leaving you, Sir, and the reader, to judge for yourselves, and shall conclude with some practical inferences, which may seem fairly deducible

deducible from what is previously laid down.

*Baron Haller* in the above cited place of his justly admired Elements, after having fully shown from experiments and reason that in the sound living human body there is no elastic air, of the nature of our Atmosphere, within the Cavity of the *Thorax*, interposed between the lungs and internal surface of the *Pleura*, draws the following conclusion, “ That by the converse of this proposition, as air, when it gets between the Lungs and *Pleura*, suppose from penetrating wounds of the *Thorax*, is hurtful to respiration, by a parity of reason the adhesion of that *Viscus* to the *Pleura* is not in the least detrimental to it, because it excludes all interposition of air ; and does not permit the Lungs to recede from the *Plura*. It hath been observed above (to wit, page 121 and 122 of the same volume) that such adhesions are extremely frequent

“quent in grown-up persons. In the  
 “*Dorcas*, (Antilope) a swift animal, the  
 “Lungs were found adhering to the  
 “*Pleura* by the Paris Academicians. And  
 “like instances have been met with, and  
 “are recorded by many authors of the best  
 “credit, (who are cited in the note) in  
 “the bodies of malefactors, that were  
 “executed, and others, who immediately  
 “before their death breathed freely and  
 “well : infomuch that it has been long  
 “the opinion of several celebrated prac-  
 “titioners, (whose names are likewise set  
 “down at the bottom of the page) that  
 “such adhesions are entirely harmless.”  
 Thus far that illustrious author.

The other opinion, besides still keeping  
 in view that such adhesions are often found  
 in asthmatic bodies, is supported chiefly by  
 reasonings drawn from the nature of respi-  
 ration, and from the structure and situation  
 of the parts immediately concerned in that  
 function. The great person, whom we  
 have

have reckoned its principal patron, in his Institutions of Medicine, paragraph 835, specifies “ broad accretions of the lungs “ to the *Pleura* as one of the many causes “ of *Dyspnœa* or *Asthma*.” And in his prelections, published by *Haller*, explaining this passage, he briefly says, “ in this case, “ while the *Thorax* is enlarging (*i. e.* during inspiration) the lungs cannot descend, and follow the diaphragm; “ whence an incurable difficulty of “ breathing arises.” And in his public lectures on the diseases of the nerves, very lately printed, there is the following passage. “ The reason why the lungs do “ not grow or adhere to the *Pleura* (in a “ natural state) is because there is then “ a moisture interposed betwixt them; “ where that is wanting, accretions form; “ and these patients, before their death, “ labour under intolerable *Asthma*.” And this is all I can find relating to this matter in his works.

In order to do what justice we can to this opinion in its turn, it will be necessary to lay before the reader some things concerning respiration in general, in which both sides, and I believe all intelligent physiologists are now agreed.

In inspiration the cavity of the *Thorax* is enlarged by the ribs being pulled up towards the first, and at the same time bent outwards, while the *Sternum* is pushed outwards and forwards, and somewhat upwards. This is effected chiefly by the intercostal muscles, the external, at least, if not likewise the internal. But it is also enlarged by the action of the diaphragm, which being rendered plainer by the constitution of its fleshy fibres, makes the *Thorax* longer and deeper. And in natural and healthy respiration, the diaphragm contributes much more to the enlargement of the *Thorax*, than the change made on the position of the ribs and *Sternum*.



equally accommodate their volume to its cavity, by their distention or constriction, thus keeping it constantly and uniformly full.

There is no elastic air interposed between the surfaces of the lungs and *Pleura*, in a state of health. Tho' this hath been much controverted of late; yet it is proved beyond all doubt by the great physiologist above named, as hath been already mentioned. The lungs and *Pleura* constantly remain almost quite contiguous to each other; there being only an unelastic moist vapour in small quantity betwixt them.

These things being laid down, it may be urged in favour of the opinion which we are now considering, that supposing there are broad close adhesions, or rather accretions of the lungs to the *Pleura*, and particularly in the lower and under part of the *Thorax*, near where the action of

the diaphragm is exercised, in that case the lungs, during inspiration, cannot descend so freely, and so far as if they were wholly detached. At the same time the diaphragm, it would appear, cannot have its full scope of play, because there will be a less quantity of air drawn into the *Thorax*, the lungs not being so much inflated, as they are when in a free natural state. And when the *Thorax* is as much enlarged as the descent of the lungs will permit, inspiration breaks off; the diaphragm ceases to act, and expiration succeeds. But while that goes on, the diaphragm cannot be pushed so freely and far into the *Thorax* as in a sound state, by the muscles of the *Abdomen* pressing the stomach and liver against it, because the lungs being fixed to the *Pleura* must in some measure resist its ascent: so that, it would appear, the motion of that important muscle must be cramped in both stages of breathing. Now as the diaphragm in a natural state contributes more to the  
change

change of the capacity of the *Thorax* than all the other causes put together, it would seem almost certain, that when its motion both upwards and downwards is thus confined, the due facility of respiration must be proportionably clogged and impaired.

The greatest difficulty attending this opinion arises from broad and close adhesions of the lungs to the *Pleura* having not been seldom met with in bodies where respiration had not been observed to be affected at all. And particularly the argument drawn from the Antilope appears to me so very cogent, that if there was reason to believe such adhesions are natural to that swift species of animals, I should give it up as altogether untenable. But looking into Pitfield's translation of the French Memoirs, (for the original is hard to come at in the country) I there find it expressly remarked that they were found only in one Antilope out of five that were opened. They therefore may be fairly deemed morbid, and for that reason the  
inference

inference drawn from them seems to lose the principal part of its strength.

But let us try what may be further offered towards solving, or at least softening this difficulty. There is most certainly a considerable latitude even in good and laudable respiration; and many degrees intervene between the most perfect kind of breathing, such, for example, as is requisite in the swift runner of a long race, the tumbler and the posture-master; and that which may be tolerably commodious in a sedentary life, in corpulency, or in old age; so that there may subsist impediments to the former without remarkably incroaching upon, or hindering the latter; and accretions of the lungs to the *Pleura* may be one species of them. There are a great many conditions necessary to constitute faultless respiration; and if one only is wanting, while all the rest remain in high perfection, the inconvenience arising from that defect may be

be scarce, if at all perceptible. I have seen a sheep, while it was dragging to slaughter, exert great agility, as well as strength, in order to save itself, discovering no signs of confined or impaired respiration. When it has been killed there have appeared in its lungs, great numbers of hydatids, many of them of the size of small cherries. And butchers inform me that this appearance is frequent. Will it thence follow that such tumors are not to be numbered amongst the causes of *Dyspnœa*? See in the *Sepulchretum* of Bonetus an observation perfectly apposite here; in which such hydatids were the sole cause of an intolerable *Dyspnœa* in a great cardinal, which proved fatal\*.

We took notice above that women use the diaphragm in respiration less than men. This is a most wise provision in nature, as it enables them during pregnancy, espe-

\* Lib. 2. Sect. 1. Observat. 33. Editionis Manget.  
cially

cially in its last months, to breathe commodiously, tho' the diaphragm then can scarce act at all, being so strongly pressed upwards by the distended uterus. It would therefore appear highly probable that accretions of the lungs to the *Pleura* are attended with much less inconveniency in the female, than in the male sex.

Moreover it may be alleged that when such accretions are formed very early in life, while the ribs and their cartilages are ductile and flexible, and in consequence the *Thorax* is more easily dilatable by the action of the intercostal muscles, their bad effects will be less, than when they first take place in advanced years, when all the parts are more stiff and rigid, and less obedient to the efforts of the moving powers. In such a case a boy may gradually be accustomed to breathe as girls do, that is to supply the deficiency of the motion of the diaphragm by a greater rising of the ribs and *Sternum* in inspiration ;

tion; and that habit in time may become natural.

Lastly, It may be added that they will be less hurtful when they are formed very slowly, than when brought on in a very short time, as by a pleurisy or a peripneumony. In the latter case the constitution will be as it were surpris'd, and greater disturbances ensue. In the former, it will gradually accommodate itself to the evil, and use the best means in order to mitigate its bad consequences, within the power of its own organism.

We shall next briefly run over such observations recorded in the abovementioned *Sepulchretum*, as seem not a little to favour Boerhaave's opinion. We shall take notice only of those, which appear highly pertinent; passing by many that might be adduced, were we disposed to make use of dubious and partial arguments.

The first we shall mention is the case of a boy, who was cut off at the age of five, by an acute pulmonary distemper, attended with great difficulty of breathing. He had been, when in his best health, constantly, and remarkably asthmatic upon running, or any other quick motion. His lungs were found adhering firmly to the diaphragm by the left lobe. The right auricle of the heart was larger than common ; and stuffed with a gross, compact, white substance, like lard. The preternatural state of the auricle was, no doubt, the cause of his swooning, and his languid fluttering pulse, a little before his death. But the *Dyspnœa*, in my opinion, could scarce be occasioned by it, even in his last illness. A polypus of the heart is much apter to create a palpitation there, than a difficulty of breathing. And much less, I think, ought the persiveness upon quick motion, when in his usual health, to be imputed to that cause. It remains then only, one would think, to ascribe his

bad respiration to the adhesion of his lungs to the diaphragm\*.

Under one head are ranged nine instances, and briefly rehearsed; in all which it would appear that adhesions of lungs to the *Pleura* were the only preternatural appearances, that could account for the *Dyspnœa*, which proved fatal in them; as no other are noted †.

And to mention only one more, in the body of a woman, who died in her pregnancy, and was asthmatic, the like strong accretions were found; and both the lobes of the lungs were of a preternatural colour. More is not said. It would appear that in this case likewise the accretions were (at least in a great measure) the cause of the disease ‡.

\* Lib. 2. Sect. 1. Observat. 61. Edit. Manget.

† Ibid. Observat. 64.

‡ Ibid. Observat. 65.

This is the substance of what I can think of in favour of the doctrine of my ever honoured master : which however I have offered the more diffidently, because it clashes with the sentiments of the other illustrious writer, who is so much my superior ; from whose elaborate works I have learned, and daily learn so much ; who by his indefatigable and well conducted industry has contributed, and still continues to contribute, towards the advancement of true medicine, at least as much as any one person now living.

I proceed to offer some practical inferences from what hath been said ; which was my principal intention in drawing up this short sketch. Supposing then, or taking it for granted, that accretions of the lungs to the *Pleura* sometimes create or increase *Dyspnœa* or *Asthma*, let us first enquire from what signs and appearances it may most probably be concluded that such accretions actually exist in any particular

cular case of *Dyspnæa* or *Asthma* which we may have occasion to treat. I say most probably, for I doubt whether any that are strictly demonstrative can be had. Such an enquiry however is necessary, that the indications of cure may be formed and prosecuted accordingly.

Before I enter upon this disquisition, let me lay it down as a preliminary, that a full, regular, and every way seemingly commendable pulse furnishes no material argument against the existence of such accretions. This is clearly proved by the noted history of a very <sup>un</sup>common disease so accurately described by Boerhaave; where tho' there were great, and close adhesions of the lungs to the *Pleura*, from the top of the *Thorax* to its bottom; tho' there was over and above a huge steatomatous tumor within the cavity of the *Thorax*, weighing near seven pounds, yet all along the pulse appeared completely faultless

less till a very little before the afflicted nobleman's death \*.

This admonition being premised, if in the case before us no other local cause of *Dyspnœa* is clearly pointed out; if that symptom is not sensibly diminished by any of the remedies found most generally effectual for that purpose in common practice; or by any means directed against other particular causes, that may most reasonably be suspected; in this precise situation a circumspect practitioner, who believes that accretions of the lungs to the *Pleura* can ever hurt respiration, will think of them, were it upon no other account than to form his prognostic. He will, with reason, be the more inclinable to entertain a belief of their existence, if he observes the patient's respiration to be performed chiefly by the motion of the *Thorax*, with little or no assistance from the diaphragm, and muscles of the *Abdomen*:

\* *Atrocis rarissimique morbi historia altera.*

To which let me add, if there is a remarkable freedom from cough. This thought was suggested to me by what I observed above thirty years ago in the body of a boy about six or seven years old; in which the lungs were found closely adhering to the *Pleura* all round. This child died atrophical; and appeared to have no remarkable difficulty of breathing. But he had been confined to his chamber, and stirred very little, long before I was called; and kept his bed mostly while I attended him. But, which appeared to me most extraordinary, he never was observed so much as once to have coughed during his illness. His voice was all along remarkably clear, and even shrill. These particulars I remember very distinctly, as they then made a strong impression upon me, tho' I cannot now so clearly recollect the other circumstances of his case. But that no more stress may be laid upon a story told so imperfectly

perfectly, than it deserves, let us consider the nature of the thing.

Coughing is occasioned by something irritating the lungs, their *Bronchia* and vesicles; the diaphragm, the *Trachea*, and its larger branches; the *Larynx*; and, upon the account of its vicinity, the *Pharynx* also: to which let me add the *Oesophagus*; and perhaps, in some cases, the stomach. It is executed in the following manner. There is first a more than ordinary effort of inspiration made; and particularly the diaphragm is strongly pulled down, pressing the liver and stomach before it, so as to make the *Abdomen* turgid. Upon which quickly succeeds a rapid contraction of the abdominal muscles, forcibly drawing up the *Diaphragm*, and creating a sudden and violent expiration, by which the air is expelled through the *Glottis* with a noise. See *Haller's Elementa*, Vol. 3. p. 300. Now if the motion of the diaphragm is

remarkably confined by accretions of the lungs to the *Pleura*, as we have endeavoured to explain above, and at the same time there is no extraordinary *Stimulus* acting upon the parts which we have mentioned, there will be a remarkable absence of cough. The execution of that action is then uncommonly difficult. And as it is partly subjected to the will, an uncommon *Stimulus* is requisite to excite it; and that is supposed to be wanting. In the lamentable history above referred to\*, there was indeed a cough from first to last, notwithstanding the broad and close adhesions of the lungs to the *Pleura*: but at the same time there was a strong perpetual *Stimulus* to excite it, to wit, the compression of the left lobe of the lungs into so narrow a compass, as to render it incapable either of transmitting blood from the heart, or of being inflated by air. But such a compression is the strongest spur to

\* *Atrocis Morbi Historia.*

urge on a cough that can be conceived. For the air vessels of that lobe must have been so strongly squeezed, as to make the insides of their walls come into mutual contact; which creates the same sensation and irritation, as if some foreign substance had got into their cavities; and rouses the whole muscular power of the *Thorax* and abdominal system, in order to create a cough, and shake off the irritating cause.

But supposing that our practitioner is willing to use some means that may take off, or at least mitigate the bad effects of adhesions of the lungs to the *Pleura*, the question remains, what means of this kind can be found? Those authors (and *Boerhaave* among the rest) who acknowledge their extreme hurtfulness, declare the evils which they bring on absolutely incurable. If therefore I should set about directing any measures with this view, the passage in the poet might be applied to me, only by changing one word,

*Avia sanandi peragro loca nullius ante  
Trita solo.*

And therefore should I miss my road in an unknown country, I might hope for some grains of allowance, some excuse for my error from the equitable and good-natured. Let us then set out.

If there really can be found no practicable method of removing in whole or in part the adhesions or accretions in question, yet perhaps some shift may be made to render their effects not so grievous and intolerable, as they would otherwise be. To give some relief in deplorable circumstances, to gain time, and even to render death easier, is doing no small service to our fellow creatures. And accordingly the great *Verulam*, in the work he valued himself most upon, warmly exhorts physicians to make it a part of their study how to bring about the *Euthanasia exterior* \*.

\* De Augment. scientiar.

In the memorable case before mentioned, *Boerhaave* directed an incessant application of flannels moistened with warm decoctions of the most emollient vegetables to the ribs, their cartilages and the *Sternum*; likewise steams of the same to be frequently drawn in by the mouth into the air vessels of the lungs; with an humid lubricating diet. This method alone was attended with such extraordinary success, that all about the noble patient for some time entertained hopes of his recovery. If therefore it was so effectual in relieving oppressed respiration, where there was, besides extensive accretions of the lungs to the *Pleura*, a tumor weighing near seven pounds within the cavity of the *Thorax*, surely it cannot miss of being serviceable where such accretions are the sole, or the principal cause of *Dyspnœa*. By the constant application of warm relaxing moisture, the ribs and *Sternum* must be rendered more pliable and obedient to the action of the intercostal muscles;

muscles; and the defect of the motion of the diaphragm be thereby, in some measure, supplied. As this method is perfectly safe, it ought always to be tried where other remedies fail. Nor is it improper, whatever the causes of *Dyspnœa* may be, which is no small recommendation of it.

As this is but a temporary remedy, and probably, unless constantly used, will produce no very lasting good effects, I have been at some pains to think of ways and means that may affect the principal cause, to wit, the accretions themselves; which if they should not be able totally to disengage them, yet may render them looser and more flexible; and so productive of lesser inconveniencies: If this could be effected, it would be more than palliating, it would be substituting a less disease in the room of a greater; and perhaps with a proper regimen enable the patient to hold out years. A remarkable diminution of the *Dyspnœa*,  
tho'

tho' falling considerably short of perfect freedom of breathing, may be tolerably comfortable, and perhaps grow better in time. I shall lay before you what occurred to me in this research.

Perusing Dr. *Störk's* treatises on the virtues of *Cicuta*, we find that schirruses and cancers, tho' firmly adhering to the ribs and *Sternum*, so as to seem growing to them, and unmoveable every way, have been often cured by its extract. As the cure goes on, the tumors become more and more moveable; and at length are found perfectly loose and free. Now while they are fixt firmly to the adjacent bones, it would appear there is some kind of adhesion of the membranes at their bottoms to those, which cover the bones, pretty much of the nature of the accretions of lungs to the *Pleura*: and therefore I should think it highly reasonable to give that extract a fair trial, either by itself, or joined to other resolvent and penetrating

netrating medicines, where it is apprehended that such accretions make a considerable part of the disease.

I am the more inclined to expect relief from this remedy, because I find it observed that there is sometimes a viscid humour about the *Pleura* and membrane of the lungs, which, it would appear, lays the foundation of the accretions. In a case recorded by *Bonetus* from *Salmuth*, to wit, the fourth of the nine already referred to, it is said, “ That in the Emperour *Ferdinand* the  
“ lungs adhered to the *Pleura* by a viscid  
“ *Pituita*, which afterwards became *gyp-*  
“ *seous* \*.” And *Valcarengus*, a celebrated physician of *Cremona*, in his elaborate observations on epidemical distempers, relates, that upon opening the bodies of many, who died of malignant pleurifies then raging, he found the external membrane of the lungs as it were plastered over with a viscid substance, as with a

\* Lib. 2. Sect. 1. Observ. 64.

new coat, which was sometimes more than an inch thick. The patients expectorated very little, and breathed with difficulty. Their inspiration was more uneasy than their expiration\*. But, as the extract of *Cicuta*, according to *Störk's* observations, is found to be the most powerful resolvent of all medicines yet known, may it not be tried in such cases? If the glutinous humour, cementing the accretions, be attenuated and dispersed, may they not be rendered more flexible and yielding, and therefore at least more tolerable, if not completely cured? May not the cohering membranes, made thicker through obstruction, when they are become more permeable, become likewise thinner, and therefore more obsequious to the motion of the diaphragm? But this I only throw out as a hint at present; submitting it to the candid and intelligent.

\* *Medicina rationalis, &c. Autore Paulo Valcarenngo. Cremonæ, anno 1737, 4to. Vid. Sect. 2. cap. 3.*

If I have any thing hereafter worthy of being offered to the public concerning this matter, I shall not fail to impart it.

Give me leave upon this occasion, before I conclude, to offer some thoughts concerning the manner of making this extract. I am throughly convinced that the principal reason why it hath often proved ineffectual in our island is because it has been made when the plant has been too young. There can be, I should think, no material difference, in point of medicinal virtue, between the *Cicuta* growing spontaneously in *Germany*, and that found in the fields of *Great Britain*. The latitude of *Vienna* differs but three degrees and some minutes from that of *London*. Great cures have been performed with that extract in *Louvain* and *Brussels*. But these two cities are nearly in the same latitude with *London*. In garden plants, a peculiarity of soil, and manner of cultivation may produce a considerable diversity of virtues in the same species. But, in such as grow wild, the  
variation

variation of two or three degrees can, in my judgement, have a very inconsiderable effect, if any at all, in a general way.

The plant flowers in July ; and its extract is directed by Dr. *Störk* to be made before the flowers open. But that is no reason why it should be made two or three months sooner. There is a wide difference between stalks and leaves new sprung, and those full grown. The one may be, and in some instances are, a mild agreeable salade, the other a nauseous medicine. I therefore take it for granted that it should not be made (without necessity) before the latter end of May at soonest, as it doth not till then acquire its full virose odour ; and therefore is not possessed of its full medical powers.

If it should be then and afterwards too dry to yield juice enough, there can be no harm, (it will even be proper, and necessary) in adding water enough to the stalks and leaves while you are bruising  
 them,

them, in order to get all the good out of the mass. The water will exhale while the extract is making. By finishing the evaporation in the sun, which is then strong, (if the weather be dry) an *Empyreuma* in the preparation will be effectually avoided.

In this manner, about the twentieth of last May, I made, for my own satisfaction, an ounce of it, which perfectly answered the characteristics required by *Störk*; to wit, it was not black and tough, but of a dark, greenish hue, somewhat crumbly if dry enough, without *Empyreuma*, but of a very particularly disagreeable smell, nearly resembling that of house-mice.

*I remain,*

*Worthy Sir,*

*Your most respectful,*

*Obedient Servant,*

Lincoln,  
June 15th, 1762.

MALCOLM FLEMYNG.