An inquiry into the medical efficacy of a new species of Peruvian bark, lately imported into this country under the name of yellow bark: including practical observations respecting the choice of bark in general / by John Relph.

AN

INQUIRY

INTO THE

MEDICAL EFFICACY

OF

A NEW SPECIES

OF

PERUVIAN BARK,

LATELY IMPORTED INTO THIS COUNTRY

UNDER THE NAME OF

YELLOW BARK;

INCLUDING

PRACTICAL OBSERVATIONS

RESPECTING THE CHOICE OF BARK IN GENERAL.

BY

JOHN RELPH, M.D.

Phyſician to Guy's Hoſpital.

Et (fateor) volui ſub eodem cortice condi.

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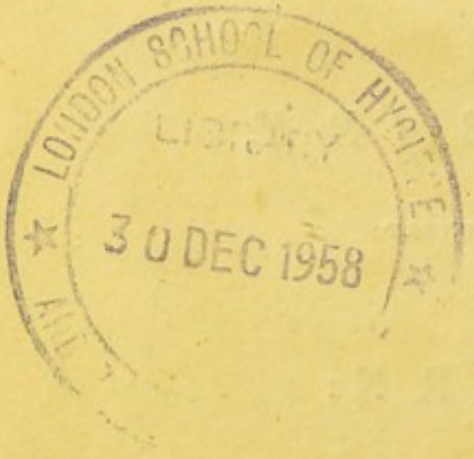

TO

WILLIAM SAUNDERS, M.D.

Fellow of the College of Physicians,

OF THE

Royal Societies of London and Edinburgh,

AND

SENIOR PHYSICIAN TO GUY'S HOSPITAL.

DEAR SIR,

It is neither the great eminence which you have juſtly attained in our profeſſion, nor any ambition of mine, to have this pamphlet honoured with the protection of the author of the admirable "Treatiſe on the Structure, Economy, and Diſeaſes of the Liver," that induces me to addreſs this Inquiry to you; for it is well

known to the public, that by your judicious and ſucceſsful inveſtigation of the comparative powers of different kinds of Peruvian Bark, you have been able to remove an inveterate prejudice, and render an important ſervice to the practice of medicine. The following ſheets therefore, in which the ſame inquiry is extended to a new ſpecies of this medicine, cannot poſſibly derive more effectual patronage than from you. My wiſh, however, is not to ſhield the ſentiments I have delivered on the preference of the yellow Peruvian Bark, under the authority of any individual; but

rather to appeal to a decision founded upon the general and impartial experience of the Faculty.

I am,

Dear Sir,

Your obliged and faithful Friend,

JOHN RELPH.

MARK LANE,
July, 16, 1794.

INTRODUCTION.

THE Inquiry here inſtituted, though capable of being much farther extended, will, I truſt, be deemed ſufficiently circumſtantial, to ſhow, that the yellow Bark, whether conſidered with a view to its natural hiſtory, its chemical analyſis, or its practical utility, promiſes to become a more valuable acquiſition to the Materia Medica, than any other ſpecies of Peruvian Bark which can now be obtained. The great ſucceſs with which I employed it, firſt induced me to give this bark a minute

Pharmaceutical inveſtigation, in conducting of which I availed myſelf of the friendly aſſiſtance of Mr. Babington, teacher of chemiſtry at Guy's Hoſpital, who very obligingly conducted all the experiments which were thought neceſſary. I have alſo particular acknowledgements to make to my friend Dr. Woodville, by whoſe aſſiſtance I have been enabled to enter very fully into the botanical hiſtory of the various ſpecies of Cinchona.

AN

INQUIRY, &c.

PERUVIAN BARK has been long and deſervedly regarded as a medicine of the firſt eſtimation in the whole Materia Medica. To obtain a complete analyſis of it, and to aſcertain its pharmaceutical properties, the Harveian Society of Edinburgh laudably decreed two prize medals. Its conſumption in Britain, and her colonial poſſeſſions in the Eaſt and Weſt Indies, is ſo very conſiderable, that to thoſe unacquainted with the quantity annu-

ally imported into this iſland, it will appear almoſt incredible; and is a ſtriking proof of the univerſality of its uſe. *

Not only in intermittent, but in moſt fevers, not ſtrictly inflammatory, Bark is the chief medicine on which phyſicians can with confidence rely. Its utility alſo in chronic diſorders is not leſs general;

* IMPORTED.

	London.	Out Ports.	Scotland.	Total.
	POUNDS	POUNDS	POUNDS	POUNDS.
1789	166334	1790	14	168038
1790	114113	1171	336	115620
1791	61139	2621	....	63760
1792	175722	....	66	175788
1793	110260	1307	10	111577

EXPORTED.

1789	19870	12	....	19832
1790	26859¼	....	252	27121¼
1791	29618¾	....	....	29618¾
1792	22825½	20	....	22845½
1793	24321½	40	....	24361½

ſo that few diſeaſes occur in which, ſooner or later, this important remedy is not found neceſſary, either in the character of a febrifuge or of a tonic. The efficacy therefore of an article ſo materially intereſting to the health of a great part of the community, may be fairly conſidered as a matter of public concern.

The attention of the legiſlature has been wiſely called forth to obviate the introduction of exotic peſtilences into this country; and it will not be deemed of much leſs importance to point out the medicine beſt adapted to ſubdue thoſe that already exiſt here, and originate with ourſelves.

The markets which ſupply our tables with animal food, are by a well regulated police reſtrained from vending what is unſeaſonable and unwholeſome; while the qualities of a drug, of the goodneſs of which we have, as yet, no abſolute criterion, and probably upon a ſingle doſe of which the life of a patient may ultimately depend, are left wholly to the diſcretion of the perſon whoſe intereſt it is to purchaſe it at the cheapeſt rate. The price of Peruvian Barks, at this time, varies from eighteen pence to nine ſhillings the pound, a variation founded upon a ſuppoſed comparative difference in their reſpective goodneſs: but as this is not regulated by any eſtabliſhed principle, but, on the contrary, determined

by an arbitrary and capricious eſtimation, it is probable that the ſcale of its price is far from being accordant with that of its intrinſic value.

Thus the ſmall quilled Bark, of a pale cinnamon colour, was for a ſeries of years generally thought to excel all others; the red Bark therefore, when firſt brought here, being extremely diſſimilar in appearance from the pale, was imagined to be unworthy of the room which it occupied in the warehouſes: upon trial, however, the latter was found to be the beſt, and, while it could be obtained genuine, conſtantly ſuperſeded the ſmall quilled Bark. Nor ought ſuch occurrences to ſurprize us,

for the trees from which the Peruvian Bark is collected, are now known to be of various ſpecies; conſequently, it may be inferred, that the ſpecies yielding the moſt efficacious Bark, would not be the firſt diſcovered. Hence, when it is found that a quantity of Cinchona Bark is imported, differing manifeſtly from any other with which we are acquainted, it becomes abſolutely neceſſary that Phyſicians ſhould aſcertain its medicinal powers by adequate experiments, and not, like the druggiſt, determine its character by its greater or leſs external reſemblance to that which has been judged of the beſt kind. In order to confirm theſe obſervations, and to give the public a competent knowledge of the ſubject,

whatever relates to the natural hiſtory of Cinchona ought to be faithfully ſtated. This I ſhall now attempt to do, before I enter upon the conſideration of a new ſpecies of Peruvian Bark, which I truſt will prove a valuable acquiſition to the Materia Medica.

The extenſive provinces, poſſeſſed by the Spaniards in South America, have for nearly two centuries ſupplied Europe with ſeveral valuable drugs, of which Cinchona, or, as it has been more commonly called, Peruvian Bark, is the principal. This was firſt brought to Spain in the year 1632, and its febrifuge power was recognized in that country from an actual trial of its ſucceſs in 1639; yet the Spaniſh

phyſicians were ſo prejudiced againſt it, that had its uſe not been promoted and zealouſly encouraged by the Jeſuits, the utility of this medicine might have been ſtill uneſtabliſhed. Notwithſtanding the patronage which it derived from the powerful influence of that religious ſociety, the oppoſition to its uſe ſoon afterwards became ſo conſiderable, that Pope Innocent the Tenth was induced to order an examination to be made into its nature and effects. The favourable reſult of this examination tended greatly to remove all objections to its ſafety and efficacy, eſpecially in Italy; though over great part of Europe the Bark was long eſteemed of a doubtful character, and its credit in Britain continued in a

fluctuating ſtate till the latter days of Sydenham.

Before the year 1730 no botanical hiſtory of the Quinquina, or Arbor febrifuga peruviana, as the Cinchona officinalis was then called, is to be found worthy of attention. The figure of a ſmall branch of it, ſaid by Ray to have been ſent by Dr. Goodall to the Royal Society, and the account given by Bollus, a Genoeſe merchant, who reſided ſeveral years in Peru, as related by Sebaſtian Badus, ſeem to have furniſhed no ſatisfactory information. Oliver likewiſe, in his communication publiſhed in the Philoſophical Tranſactions, ſays nothing of it deſerving of notice: ſo that Arrot's "Account of the

Henry Heywood

Peruvian or Jeſuits Bark," read before the Royal Society in 1737, is the firſt in order of time which appears to claim any conſideration.

Mr. Arrot, a ſurgeon, who was in Peru a few years before Condamine, gives the following relation :

" The tree from which the Je-
" ſuits Bark is cut, grows in the
" kingdom of Peru, in the Spaniſh
" Weſt Indies, and is found moſt
" commonly in the provinces of
" Loxa, Ayavaca, and Quenca,
" which are ſituated between two
" and five degrees of ſouth lati-
" tude. This tree is tall, and has a
" trunk rather bigger than a man's
" thigh, tapering from the root
" upwards, has no boughs or

" branches till near its top, which
" grow as regular as if lopped ar-
" tificially, and with the leaves
" form exactly the figure of a he-
" miſphere: its bark is of a black-
" iſh colour on the outſide, and
" ſometimes mixt with white ſpots,
" whence commonly grows a kind
" of moſs, called by the Spaniards,
" Barbas: its leaves reſemble much
" the leaves of our plumtree, of
" a darkiſh green colour on their
" upper or concave ſide, and on
" their lower or convex ſide, red-
" diſh: its wood is as hard as our
" common Engliſh aſh, and rather
" tough than brittle."

" There are four ſorts of the
" bark of this tree, to which the
" Spaniards give the following

" names, viz. caſcarilla colorada,
" or reddiſh bark; amarylla, yel-
" lowiſh; creſpilla, curling; and
" blanca, whitiſh. But Mr. Arrot
" could only find two different
" ſorts of the tree, and he believes
" that the other two ſorts of the
" bark are owing to the different
" climates where it grows, and not
" to a different ſpecies of the tree.
" The bark called colorada and
" amarylla, is the beſt, and differs
" from the blanca in this, that the
" trunk of the former is not nigh
" ſo big as that of the latter, the
" leaves as deſcribed above; where-
" as thoſe of the blanca are larger,
" and of a lighter green colour,
" and its bark has a very thick
" ſpungy ſubſtance, whitiſh on the
" outſide, and is ſo tough, that it

" requires the force of an axe to
" ſlice it from the tree. 'Tis true
" indeed, it is as bitter when cut
" down as the beſt ſort, and has
" then the ſame effect in intermit-
" ting fevers; but when dry and
" long kept, turns quite inſipid
" and good for nothing. And it
" is to be obſerved, that both ſorts
" have a much ſurer and quicker
" effect in cures when green, than
" when dry. As the bad ſort is
" in great plenty, and the beſt very
" ſcarce and hard to be come at,
" large quantities of it are cut
" yearly, and ſent with a little of
" the fine bark to Panama, for
" Europe."

" The tree of the creſpilla is the
" ſame with that of the amarylla

" and colorada, but grows in a
" cold frosty climate; by which
" means the bark is not only altered
" in its quality, but is also whitish
" on the outside, though cinamon-
" coloured within, and ought in
" medicines to be rejected. This
" sort and the blanca grow plenti-
" fully in the province of Ayavaca,
" fifty leagues from Piura, and
" sixty-two from Payta, a port in
" the South Sea; as also in Cari-
" amango, Gonsonama, and Xim-
" buro; whence they commonly
" send it to Payta, and there sell
" it as the best. The blanca like-
" wise grows in the province of
" Quenca, and in the Mountains of
" Caxamarea; but the true and
" genuine fine Jesuits Bark, which
" is of a reddish or yellowish co-

" lour, is only found from five
" to about fourteen leagues round
" the city of Loxa, in the pro-
" vince of Loxa, called generally
" by the Spaniards, Provincia de las
" Calvas. This city is ſituated be-
" tween two rivers, that run into
" the great river Marannon, or of
" the Amazons, and lies about an
" hundred leagues from Payta, and
" in a direct line about an hun-
" dred and ten leagues ſouth-eaſt
" from Guayaquil, though by the
" common road near two hundred.
" The places about Loxa, where
" this fine ſort is found, are, Sierra
" de Caxanuma, Malacatos, Yruta-
" ſigna, Yangana, Manſanamace, La
" Sierra de Boqueron, and a place
" called Las Monſas."

" The Bark trees do not grow
" all together in one ſpot, but
" intermixt here and there with
" many others in the woods; it
" happens, indeed, ſometimes, that
" cluſters of them are found to-
" gether, though at preſent they
" are much ſcarcer than in former
" times, a great many of the fine
" large bark trees having been en-
" tirely cut down, that their bark
" might the more eaſily be ſliced
" off."

" The ſoil where the beſt ſort
" thrives, is generally in clayey or
" rocky ground, and very fre-
" quently on the banks of ſmall
" rivers deſcending from high
" mountains."

Mr. Arrot is of opinion, " that " a very ſhort time will put " an end to this beſt ſort, or, " at leaſt, it will be extremely " hard to be got, by reaſon of " its diſtance from any inhabited " place, the impenetrability of the " woods where it grows, and the " ſcarcity of the Indians to cut it, " who, by the Spaniards hard uſage " and cruelty, are daily diminiſh- " ing ſo faſt, that in a very few " years their race in that country " will be quite extinct."

Mr. Arrot ſays, " the ſmall bark " which curls up like ſticks of " cinnamon, (and which in Eng- " land is much eſteemed, as being " cut off the branches, and there- " fore reckoned better and more

" effectual in curing fevers) is only " the bark of the younger trees, " which, as it is very thin, curls " in that manner; and that the " bark of the branches would not " compenſate the trouble and ex- " penſes of cutting."

This account, which was extracted from the papers of Mr. Arrot, by Mr. Gray, F. R. S. is here tranſcribed as far as ſeems applicable to the general purpoſe of this Inquiry.

Monſ. de la Condamine, whoſe 'Memoire ſur l'Arbre du Quinquina,' was communicated to the Royal Academy of Sciences at Paris, in 1738, gives the moſt complete account of the ſubject

which has hitherto been publiſhed, and which comes now under conſideration.

He ſays that, 'the beſt Quinquina, or at leaſt that which is moſt eſteemed, grows on the mountain of Cajanuma, ſituated about two leagues and a half to the ſouth of Loxa; and that it was from thence the firſt Peruvian Bark brought to Europe was obtained. And that it is no longer than fifteen years ſince the dealers in bark, in order to ſell it to the beſt advantage, produced certificates in teſtification of its having being bought at Cajanuma.' Condamine therefore viſited this mountain, and paſſed a night upon its ſummit, in the houſe of a man

whoſe ſole buſineſs was confined to gathering the Quinquina. In aſcending and deſcending this mountain, Condamine availed himſelf of the opportunity of examining the trees moſt eſteemed for the goodneſs of their bark, and from which he took the botanical ſpecimens afterwards delineated and publiſhed by the Royal Academy. He ſays, 'they commonly diſtinguiſh the Quinquina into three ſorts, though ſome reckon four; the white, the yellow, and the red; at Loxa they told me, that the difference of theſe three kinds is confined to the virtue of the bark, the white having ſcarcely any, and the red being ſuperior to the yellow. With reſpect to the trees furniſhing theſe three kinds of bark there is no

eſſential difference: but my hoſt at Cajanuma, who conſtantly reſides on that mountain to bark the trees, aſſured me, (and of which I have been ſince confirmed by thoſe beſt informed) that the yellow and the red neither manifeſt any difference in the flower, the leaf, the fruit, nor even in the outer ſurface of the bark; in ſhort, that the one is not to be diſtinguiſhed from the other by external appearance, and that the knife only determines this; for on cutting the yellow, its bark appears of a leſs deep colour, and more tender. In regard to the red and the yellow, they grow cloſe to each other, and their barks are collected indiſcriminately, although the red is thought to be the better: on drying, their dif-

ference of colour becomes leſs diſcernible, and both barks are equally brown on the upper ſide, which is conſidered as the moſt certain criterion of the goodneſs of the Quinquina, and is what the Spaniſh expreſs by *envez prieta*. The bark which is rough on the outſide, cracked, and brittle, is ſold at the higheſt price.'

'Reſpecting the white Quinquina, my hoſt at Cajanuma aſſured me, that its leaves are rounder and rather rough, or leſs ſmooth than thoſe of the two others; its flowers are alſo whitiſh, its ſeeds larger, and its outer bark whitiſh. Its place of growth is uſually on the higheſt mountains, and never in the ſame places with the yellow

and the red Quinquina trees, which commonly grow about half way up the mountains in dells and receſſes, and in ſituations the moſt ſheltered.'

Whether the white Quinquina be a variety of the other, occaſioned by a difference of ſoil and the intenſe cold to which it is expoſed, Mr. Condamine had not an opportunity to determine; but he thinks it probable, as the Quinquina growing in the hotteſt ſituations, is found to poſſeſs the moſt virtue.

'The Quinquina tree never grows in the plains, it is ſtraight, and may be diſtinguiſhed at a diſtance on every ſide, by its top being elevated above the neigh-

bouring trees with which it is ſurrounded; for it is never found in clumps, but is always ſcattered among others of a different kind. When unmoleſted it grows to a large ſize: ſome have been found larger than the body of a man, and the ſmalleſt are eight or nine inches in diameter. But it rarely happens that any are found of this ſize on the mountain which furniſhed the firſt Quinquina: for the trees from which the firſt bark was taken, and which were very large, are now all dead, in conſequence of having been totally ſtripped of their bark, a proceſs which infallibly kills the old trees, and often proves deſtructive, though leſs frequently, to the younger ones.'

'It does not appear that the trees growing in the neighbourhood of thoſe which were formerly preferred, but now deſtroyed, ſhould have Bark of leſs virtue than the ancient Bark; for the ſituation and ſoil being the ſame, the difference if it be not accidental, muſt be entirely owing to the different age of the trees.'

'The demand for the Bark has been ſo great, that at this time ſcarcely any but young trees are to be found. I have ſeldom ſeen any of the trees thicker than my arm, nor higher than from twelve to fifteen feet; but theſe, on being cut, ſend off new ſhoots from the root.'

'They told me at Loxa, that formerly the very thick Bark was preferred, and kept apart as the moſt valuable; but at preſent preference is given to the ſmall Bark. It may be ſuppoſed that the Bark merchants found this to their advantage, as being the moſt convenient for package; but a Director of the Engliſh South Sea Company at Panama, through which all the Quinquina exported into Europe muſt neceſſarily paſs, aſſured me, that the preference now given to the twig, or ſmall Bark, is founded on chemical analyſis and experiments which were made upon both theſe barks in England: it is probable that the difficulty of perfectly drying the

thick Bark, and the facility with which it contracts humidity, and which it long retains, may alſo have contributed to render it of leſs eſtimation.'

Mr. Condamine proceeds to ſay, 'that every day at Cajanuma, near Loxa, and adjoining the ſame chain of mountains, new Quinquina trees are found; ſuch as thoſe at Ayavaca, thirty leagues ſouth-eaſt of Loxa, where the Quinquina is ſaid to be very good, and of which much has been lately ſold. Other trees of this kind have likewiſe been diſcovered near Rio Bambo, about four leagues to the north of Loxa, in the neighbourhood of Cuenca. Alſo on the mountains of Jean, fifty or ſixty leagues ſouth-eaſt

of Loxa, and this laſt Quinquina has been exported into Europe, where it was deemed leſs efficacious than the other ſorts.'

Having now preſented the reader with every part of Condamine's account which is capable of throwing any light on the natural hiſtory of the Peruvian Bark, it ſtill remains that I ſhould ſtate what Juſſieu has written upon this ſubject, as found in the Hiſtory of the Royal Society of Medicine at Paris, vol. 3. p. 252.

Dr. Joſeph de Juſſieu was at Loxa two years after Condamine, where he examined the Quinquina in the character of a botaniſt as well as in that of a phyſician.

'From the MS. left by him, the generic characters of the Quinquina agree with thoſe mentioned by Condamine; but he notices more ſpecies; theſe however may be reduced to two principal ones, of which the others are perhaps only varieties. The firſt ſpecies comprehends the red Quinquina, the yellow, and the knotty, all of which have very ſmooth leaves, purpliſh, and almoſt inodorous flowers, and bitter Bark, more or leſs coloured. Of theſe three, that moſt eſteemed is the red, and was the firſt in uſe: it produced its effects ſo ſoon, that it juſtly acquired the celebrity it merited.'

'It became ſo ſcarce that Juſſieu could procure but very little of

it in the neighbourhood of Loxa, where, for this Bark, is neceſſarily ſubſtituted that of the yellow or the knotty, which the Spaniards prefer for their own uſe, becauſe they are conſidered to be leſs active and leſs heating. Notwithſtanding this national prejudice, Juſſieu does not heſitate to decide in favour of the red, the virtue of which he tried upon himſelf.'

'The ſecond ſpecies comprehends four varieties of the white Quinquina, all of which differ from the firſt ſpecies in having large roundiſh hairy leaves, and very fragrant flowers, beſet within, with white hairs; the capſules alſo are longer, and the exterior Bark whitiſh. Two of theſe have the inner layer

of Bark approaching to red, with little bitterneſs, and, when freſh, poſſeſſing a febrifuge power, which is only of ſhort duration.'

'The Bark of the other two varieties is white, inſipid, and without virtue; and their flowers exhale the moſt ſweet odour, by a compenſation of nature, which ſeems to have carried that aroma to the flowers which is refuſed to the Bark.'

'In this account it is alſo obſerved, that the very beſt Bark loſes ſlowly a part of its efficacy on being long kept; hence it is aſked, if we may not conclude, that the active principle of thoſe ſubſtances is not volatile, or ſuſcep-

tible of a decompoſition more or leſs rapid. What confirms this opinion, is, that the Quinquina at Peru is more efficacious than in Europe; and Juſſieu found that an extract made of good recent Bark, had, when brought to Europe, more virtue than a ſpecimen of the ſame Bark from which it was prepared. This extract retained its efficacy undiminiſhed for thirty years. It is here remarked, that as the red Bark is now only to be obtained in a ſmall quantity, and as the yellow and the knotty, from ſupplying the great demand of the market, cannot furniſh the neceſſary conſumption a long time, it is thought, that unleſs the Quinquina becomes regularly cultivated, or that new foreſts of it be diſco-

vered, Europe muſt ſoon lament the want of this valuable medicine.'

Having now reviewed the only original authorities to which all knowledge of the Quinquina was long confined, it becomes neceſſary to examine what further information on the ſubject, is to be derived from the late rapid extenſion of every branch of natural hiſtory, and more eſpecially that of ſcientific botany.

A ſpecimen of the Quinquina ſent to Linnæus, fully enabled him to determine its generic characters, and to aſſign it to its proper place in his Syſtema Vegetabilium; he found alſo that in natural affinity, it ranked in the order Contortæ.

From the lady of the Count del Cinchon, who firſt ſpread its reputation, Linnæus called it Cinchona; of which he has only given two ſpecies, viz. Cinchona officinalis, referred to Condamine, and defined Cinchona panicula brachiata, and the Cinchona caribæa, or Cinchona pedunculis unifloris, firſt aſcertained by Jacquin.

This latter, which is a native of the Weſt Indies, differs ſo widely from the former, that Linnæus in the 13th edition of his Syſtema, ſeems to have entertained ſome doubts if it really belonged to the genus Cinchona. The bark taken from the trunk of this tree, is of a plano-convex form, and according to Murray, about a ſpan in

length, and a line and a half in thickneſs; two ſtrata of which are very evident, that immediately under the epidermis is yellowiſh, ſpongy, inſipid, eaſily rubbed into powder between the fingers and thumb, and is externally rough, and interſected by deep fiſſures. The inner ſtratum is compact, fibrous, of a more deep or greeniſh brown, and of a nauſeous ſweet, and intenſely bitter taſte. The bark of the branches is convoluted, and covered with a thin, grey, wrinkled cuticle, beſet with lichen leproſus; all the bark of the branches is more tender, and of a lighter colour. The radiſh-like and aromatic taſte which Dr. Wright diſcovered, on firſt putting this bark in his mouth, could not be

perceived by Profeſſor Murray, nor could he find that it poſſeſſed any ſenſible aſtringency. But all the ſpecimens of it (which he had from Dr. Wright) exhibited on the internal ſurface, an appearance of *ſhining minute cryſtals.*

Murray thinks that the outer ſtratum ought to be rejected as effete: the inner, when powdered, has the appearance of common Peruvian Bark, but from the experiments of Dr. Skeete, it is much leſs aſtringent. In the opinion of Dr. Wright, the Bark of the Caribean Cinchona is not inferior in efficacy to that of the officinalis.—See a full account and figure of this ſpecies in the Philoſophical Tranſactions, vol. 67.

The Cinchona floribunda another ſpecies, diſcovered in the Weſt India Iſlands, eſpecially at St. Lucie, and hence called the St. Lucie Bark Tree, has ſince the year 1780 become well known.

Mr. Davidſon's account of it in the 74th vol. of the Philoſophical Tranſactions, is accompanied with a figure, by which it may be compared with the other ſpecies of this genus. It is there characterized Cinchona floribus paniculatis glabris, laciniis linearibus, tubo longioribus ſtaminibus exſertis; foliis ellipticis glabris.

The bark of this ſpecies is covered with a greyiſh epidermis, marked with whitiſh ſpots, origi-

nating probably from lichens: the inner ſubſtance is of a pale brown colour, and of a fibrous and ſomewhat tough contexture: the pieces are variable in form, but commonly thin, long, and convoluted. Its taſte is at firſt aſtringent, but this quality is ſoon overcome by the intenſe bitterneſs with which it is ſucceeded; this bitterneſs reſembles that of gentian, and is very nauſeous: it is without odour, nor does it manifeſt any upon evaporating the fluids in which the bark is macerated. It gives out nearly all its ſolubile matter to water, and affords almoſt a fourth part of its weight, of watery extract. It has been found to be a powerful medicine; but its nauſeous bitterneſs often renders it emetic, hence few

ſtomachs can bear it, unleſs adminiſtered in ſmall doſes.

Monſ. de Galvés, miniſter at the court of Madrid for the Indian department, received ſpecimens of two ſpecies of Cinchona, lately diſcovered near Santa Fé, in South America, accompanied with boxes of their bark in powder.

By order of his Catholic Majeſty, Mr. Ortega, profeſſor of botany at Madrid, ſent ſpecimens of this bark to the Royal Society of London, and to that of Medicine at Paris, with a view to determine its medicinal utility. Reſpecting the determination of the former, I know nothing more than what Sir George Baker has ſaid in

the Medical Tranſactions, viz. "In the month of December, 1778, Mr. Ortega, profeſſor of botany at Madrid, by order of the Spaniſh miniſtry, ſent hither two varieties of the Quinquina, very different in appearance from that with which we had been acquainted; it was, however certified, that they were ſpecies of Quinquina; and they were ſaid to have been brought from the kingdom of Santa Fé. Our Royal Society being conſulted, appointed a committee to inquire whether or no they were likely to anſwer the purpoſes of the true Bark. Upon trial they were found far inferior. Towards the end of the year 1779, or the beginning of the year 1780, conſiderable quantities of both theſe ſpecies were

found mixed with the common Bark; and likewiſe a great deal of a certain ſpurious Bark, in colour not unlike the true, but ſmoother externally, and internally remarkable for its longitudinal fibres. I do not know that any experiments have been made with this drug, or that it is a Quinquina; but from its taſte and appearance it would ſeem of much leſs value than the common."

The two ſpecies ſent to the Royal Society of Medicine at Paris, were alſo referred to a committee of that body, who reported, 'that the botanical ſpecimens, though well preſerved, were incomplete. They could, however, from inſpection, determine their ſpecific

characters. The leaves of the firſt were oval, ſmooth, marked with reddiſh nerves, and reſembled in every reſpect thoſe of the red Quinquina, which Condamine ſent from Peru, and which Monſ. de Juſſieu preſerves in his Herbarium; and the ſame reſemblance is alſo obſervable in the fruit. Therefore without ſeeing the flowers, or the Bark, we are enabled to ſay, that it is a good ſpecies, and we are led to believe that it is the true red Quinquina which has become ſo ſcarce at Loxa.'

'The ſecond ſpecimen, of which the leaves are very large, roundiſh, and hairy, and the flowers beſet on the inſide with hairs, is known by theſe circumſtances to be the

white Quinquina, or a bad kind; beſides, the capſules are elongated and approach to thoſe of that ſpecies which Monſ. de Juſſieu ſays is abſolutely without virtue. The bark of the firſt ſpecies is of a pale yellow, ſenſibly aromatic, moderately bitter, and very aſtringent. That of the ſecond is of a deeper yellow, approaching to the colour of turmeric, with little odour, great bitterneſs, and ſcarcely any aſtringency. Chemical analyſis of theſe Barks confirmed the opinion entertained of them by botanical obſervation; for four ounces of the firſt ſpecies of Bark afforded an ounce of watery extract; while from the ſame quantity of the latter, only five drams were obtained.'

Murray informs us, that ſpecimens of theſe two were ſent to the Linnean Herbarium, and alſo to that of Sir Joſeph Banks, one of which (*a*) was called C. Peruviana, becauſe found by Louis Née, at Loya, in the kingdom of Peru; the other (*b*) C. Bogetenſis, was found the ſame year in the country of Santa Fé, in Carthagena.

The Cinchona anguſtifolia, floribus paniculatis glabris, capſulis oblongis pentagonis, foliis lineari-lanceolatis pubeſcentibus, is a ſmall ſpecies of Cinchona, firſt deſcribed by Swartz, and found growing on the banks of rivers in St. Domingo. The bark, upon the lower part of its trunk, is, thick, rough, cracked, and externally greyiſh, or of a dark

colour; its internal ſurface is clammy; this viſcoſity is alſo obſervable in the bark of the upper part and of the branches, though in a leſs degree. Its taſte is intenſely bitter, accompanied with a ſomewhat ſweetiſh and aromatic flavour. Watery and ſpirituous infuſions of this Bark, are of a deeper colour than thoſe of the common Bark, and become black by the addition of a ſolution of iron. Other experiments made by Swartz ſhew, that this Bark is nearly allied to the common Cortex Peruvianus.

The Cinchona corymbifera, deſcribed in the Supp. Plantarum, was diſcovered more than twenty years ago by Forſter, in ſeveral iſlands in the South Sea. Its cha-

racter is C. foliis oblongo-lanceolatis, corymbis axillaribus. The Bark of this ſpecies, according to Forſter, is very bitter, moderately aſtringent, and nearly reſembles the Peruvian Bark; but Murray thinks that it more cloſely accords with the Santa Fé ſpecies, (*a*) or C. bogetenſis: it is of the convoluted form, though Barks of various ſpecies have been ſold for that of the C. corymbifera.

Profeſſor Vahl, in the Tranſactions of the Natural Hiſtory Society at Copenhagen, has arranged all the ſpecies of Cinchona, of which proper ſpecimens could be procured, into botanical order; and of four of theſe he has given figures. His firſt diviſion comprehends all

thoſe of which *the flowers are hairy, and the ſtamina are concealed within the tube of the corolla*, including

1ſt. Cinchona officinalis, or C. foliis ovatis lanceolatis glabris, capſulis oblongis.

2. C. pubeſcens,

C. foliis ovatis baſi elongatis ſubtus pubeſcentibus, capſulis cylindricis.

3. C. macrocarpa,

C. foliis oblongis ſubtus pubeſcentibus coſtatis.

Having a ſmooth corolla and ſtamina longer than the tube.

4. C. caribaea,

C. pedunculis axillaribus unifloris.

5. C. corymbifera,

C. foliis oblongo-lanceolatis, corymbis axillaribus.

6. C. lineata,

C. panicula terminali, foliis ovatis acuminatis glabris, capſulis pentagonis.

7. C. floribunda,

C. panicula terminali, capſulis turbinatis levibus, foliis ellipticis acuminatis.

8. C. brachycarpa,

C. panicula terminali, capſulis obovatis coſtatis, foliis ellipticis obtuſis.

9. C. anguſtifolia,

C. panicula terminali, capſulis oblongis pentagonis, foliis linearilanceolatis pubeſcentibus.

The *firſt* is ſaid to be a native of Loxa, and is deſcribed from a

ſpecimen in the Herbarium of Juſſieu. Vahl refers it to the Quinquina figured by Condamine, and to the C. officinalis of the 10th edition of the Syſt. Veget. or C. panicula brachiata, in the Species plantarum. But on comparing the figure of it, as given by Vahl, with the original ſpecimen preſerved in the Linnean Herbarium, a conſiderable difference is obſerved. It is therefore probable, that the Barks of both ſpecies have been indiſcriminately imported into Europe for medical uſe.

The *ſecond* was likewiſe obtained from Juſſieu, who has ſtated it to be of the Peruvian ſpecies. We find no ſynonyma of it ſubjoined, but Vahl ſuppoſes it to be the Quin-

quina blanc of Condamine, and our inquiries have convinced us that he is right; and as ſynonyma of this, we may refer to the Caſcarilla blanca of Arrot, and to the ſecond ſpecies noticed in the report of the Royal Academy of Medicine at Paris, (*b.* C. Bogetenſis) ſaid to be brought from Santa Fé; the bark of which is ſtated to be of a deep yellow colour, approaching to that of turmeric, with little odour, great bitterneſs, ſcarcely any aſtringency, and affording little extract.

The *third* ſpecies which was brought from Santa Fé, and given to Vahl by Mr. Ortega, is referred to the Cinchona of Mutis, and deſcribed as the officinalis by Linné,

in his 12th edition of the Syſt. Veget. and ſtill retained in the Supp. Plant. and in Murray's Syſt. Veget. Vahl obſerves that Mutis could not ſend the officinal ſpecies to Europe, as he never was at Peru, the only country which is known to produce it; beſides, the Linnean deſcription here alluded to, neither agrees with the character nor the figure of the Cinchona given by Condamine.

This appears to be the firſt ſpecies mentioned in the report made by the Pariſian Academicians, and that marked (*a*) C. peruviana, in the Herbaria of Sir Joſeph Banks and Dr. Smith. On the teſtimony of the French Academy, it yields a fourth part of its weight

of extract, and is in every reſpect equal to the beſt officinal Bark, agreeing nearly to the character of the red Bark.

Murray deſcribes the Bark, from his own ſpecimens, to be in long, flattiſh, ſmooth pieces, about a line and a half in thickneſs; its cuticle is white and warty; the bark is of a browniſh yellow, fibrous, and much leſs bitter than any of the other Peruvian ſpecies of Cinchona: for though ſent from Santa Fé, it was found by Louis Née at Loya, in the kingdom of Peru.

Vahl ſays, that a few years ago, a conſiderable quantity of it was imported into Madrid, and continued in great eſtimation with the

phyſicians there. However, both the bark of this ſpecies and that of the *pubeſcens*, on being tried in this country, were found, according to the report of Sir George Baker, inferior to common Peruvian Bark, as has been already ſtated at page 40.

The fourth, ſeventh, and ninth ſpecies, we have already fully noticed, under the ſame names as here adopted by Vahl.

The fifth ſpecies, found by Forſter in the South Sea Iſlands, the ſixth, a native of St. Domingo, and the eighth, a native of Jamaica, all ſeem to afford bark poſſeſſing a certain ſhare of medicinal power; but to what extent, experi-

ments have not as yet enabled us to give any ſatisfactory account.

In addition to the ſpecies here enumerated, ſome others might be adduced, but as little is known of their botanical hiſtory, or medical effect, it would anſwer no uſeful purpoſe to enter upon their deſcription. The ſpecies of Cinchona figured by my ingenious friend Dr. Woodville, in his Medical Botany, as the ſuppoſed parent of red Peruvian Bark, reſts on the authorities of Combe and Groſchke, and is ſuggeſted merely as matter of probability.

Upon reviewing all theſe accounts on the intereſting genus of Cinchona, it muſt appear a taſk of

the utmoſt difficulty, to refer the different Peruvian Barks now medically employed, to one or other of the ſpecies above-mentioned. Even the true officinal ſpecies of Cinchona, ſeems not yet preciſely determined; and the lubricious or variable tendency of this genus (which the preceding information implies) may have been one cauſe of this obſcurity. Had a botanical ſpecimen of this tree always accompanied the importation of every different kind of bark, much might have been done; but unfortunately we have no botanical knowledge of ſome ſpecies, whoſe bark is juſtly in the greateſt eſtimation; and on the contrary we are unacquainted with the bark of others, the bo-

tanical characters of which are well aſcertained.

From Condamine's account it appears, that thoſe trees which he calls the beſt ſpecies of Cinchona, conſtantly affect ſituations at about an equal diſtance between the baſe and ſummit of mountains, and eſpecially where they form ſuch receſſes or hollows as are ſcreened from the cold winds. Hence he concludes, that the beſt bark is collected from trees growing in the hotteſt places: but as theſe remarks were only applied to the mountains of Cajanuma, which are ſituated between two and five degrees of ſouth latitude, it is probable that the ſame ſpecies, deſtined

to grow at a greater diſtance from the equator, would require a leſs elevated ground, where they would ſtill enjoy an equal degree of heat. Accordingly, it is found, that the Cinchona grows in very different parallels of latitude, both to the north and ſouth; nor do mountainous ſituations ſeem to give any determinate character to its bark. For in the hiſtory of the Peruvian ſpecies before given, it is poſitively aſſerted, that the Cinchona trees manifeſtly of the ſame ſpecies, and growing near to each other, produce barks which are widely different, and that this is the caſe with reſpect to the red and yellow Bark, which are not to be diſtinguiſhed while growing, till cut by the knife.

It is therefore to be preſumed, that the growth of the beſt bark is not to be circumſcribed to any limited diſtrict; and indeed it has proved ſo in fact, for it appears upon unqueſtionable authorities, that little or none of the Loxa Bark has been imported here for ſale, during the laſt forty years, though ſince that time we have had bark equally efficacious, or ſuperior to the old bark firſt in uſe; conſequently we have a well-founded hope, that the vaſt and unexplored foreſts of South America, will continue from century to century, to open new ſources of this invaluable medicine: nor can it be deemed too preſumptuous to ſuppoſe, that ſome ſpecies of Cinchona may yet be diſcovered,

of more advantage to medicine, than any which has hitherto been employed.

I have been led to this conſideration from lately uſing a ſpecies of Peruvian Bark, which, till within the courſe of laſt year, has been unknown in this country, and which promiſes, by the trials made with it, to ſurpaſs in efficacy, all the others now uſed for the purpoſes of medicine.

This is now known in London by the name of Yellow Bark; but from the deſcription of it which follows, it will appear to be different from the yellow kind noticed by Arrot and Condamine, or indeed of any other author except

Murray, who has deſcribed a "Cortex Chinæ, vel Chinchinæ Regius, ſeu Cortex Chinæ Flavus," with which it ſeems to agree, both in its external and medical characters. Of this Royal Yellow Quinquina, profeſſor Murray gives the following account. (Vide Murray Appar. Medicam. vol. 6.)

"This Bark not long ago was brought from London under the foregoing name. Of what country it is a native I know not. But in the month of June, 1790, when I was at Frankfort on the Main, I ſaw ſpecimens of it with Mr. Salzwedel an experienced apothecary, who favoured me with one of them. I ſaw it afterwards in an apothecary's ſhop at Wiſbad. It

bore then a high price, a pound of it being ſold for ſixteen dollars by Meſſrs. Ettlings druggiſts at Frankfort. This bark conſiſts of flattiſh pieces, of about the length of a finger, the breadth of the thumb, and a line in thickneſs. Its colour is yellowiſh, inclining to that of the ruſt of iron. It partakes more of the ferruginous colour on its external, than on its internal ſurface, owing to the cloſe adheſion of the epidermis to the bark. Both in its fracture and on the ſurface, it appears fibrillous, breaking ſo eaſily between the fingers, that it may be rubbed into a yellow powder. Its taſte is intenſely bitter, with a ſlight degree of aſtringency. Its efficacy, by certain of the Frankfort phyſicians,

is conſidered, as very far ſuperior in intermittant fevers, to the bark commonly employed. I have no doubt of this bark being the ſame with that lately ſent me by the celebrated L. B. Ab Aſch, under the name of the Cortex Chinæ Flavus, though it ſeemed to me ſomewhat more ponderous and compact, but reſembling it in appearance, and not inferior to it in bitterneſs. It will be the means of avoiding confuſion, if, in future, this bark ſhould be denominated the Royal Yellow Bark; for lately at Amſterdam, ſome bark was ſold under that appellation, for fourteen florins a pound, which, from the ſpecimens I have ſeen, appeared to me, to reſemble in every reſpect, the red Peruvian Bark, but of a ſomewhat

paler red. Dr. Thueſſink, in a letter to Profeſſor Blumenbach, (dated the 25th Auguſt, 1790) has ſaid, that it is called Royal Bark, becauſe it was intended for the uſe of the Royal Family of Spain; and he was ſatisfied from his own experience, that, it very far excelled the common Peruvian Bark in efficacy. Its colour is not properly yellow, but more nearly reſembles that of the ruſt of iron.

Monſ. Condamine, and Joſeph de Juſſieu, have made mention of a bark found in the kingdom of Peru, of a yellow colour; and Mr. Arrot has noticed a yellowiſh bark; but we cannot from their deſcriptions find out characters which agree with thoſe above."

I have here related the whole of what Murray has ſaid reſpecting this bark, in order that it may be the more fully compared with the yellow Bark, which is the ſubject of this treatiſe, and which I ſhall deſcribe as follows:

This Bark, though denominated yellow, is only to be underſtood, as approaching nearer to that colour, than any other ſpecies of Peruvian Bark, imported into this country, eſpecially when reduced to powder. It conſiſts of flattiſh irregular pieces, of a cinnamon colour, inclining to red, and having in certain directions of the light, a peculiar ſparkling appearance on the ſurface. They are very generally diveſted of the cuticle,

of a fibrous texture, dry, and rigid to the feel, and eaſily rubbed into powder between the fingers and thumb; neither remarkably weighty nor the contrary. They have little odour, but to the taſte manifeſt intenſe bitterneſs, with a moderate ſhare of aſtringency, together with a certain flavour correſponding unequivocally to thoſe of the Cinchona officinalis. The external ſurface of this bark, is of a ſomewhat deeper colour than that of the internal, and in ſome ſpecimens it is as deep as that of the red Bark. The pieces vary much in ſize; ſome are about two inches and a half in length, an inch in breadth, and the ſixth of an inch in thickneſs; while others are ſtill ſmaller, and ſome are to be found from

twelve to eighteen inches in length, with the breadth and thickneſs in proportion. I have alſo ſeen whole cheſts of this bark, the pieces of which were nearly cylindrical, and as completely covered with outer coat, as the moſt perfect ſpecimens of common Bark. The epidermis of the large pieces of the yellow Bark, is of a reddiſh brown colour, rough, and of a ſomewhat ſpongy texture; but that of the ſmaller pieces is of a grey colour, harder, and much more compact.

On comparing this deſcription of the yellow Bark with that given by profeſſor Murray, of the Cortex Chinæ, their ſimilitude becomes ſufficiently obvious to determine me to conclude, that they are of the

ſame ſpecies. Their external reſemblance, and the qualities they manifeſt to the organs of taſte, tend mutually to confirm this opinion; though, from not poſſeſſing any ſpecimens of the Cortex Chinæ, it is impoſſible that the identity of theſe barks can be abſolutely aſcertained.

Another proof, that this yellow Peruvian Bark, is the ſame with that which profeſſor Murray deſcribes under the name of Cortex Chinæ Flavus, appears from letters received here from different Spaniſh merchants at Cadiz, in one of which, dated September, 1789, it is obſerved, "The yellow Bark, which has only been lately known, is infinitely ſuperior to all the other

barks, by its activity and admirable properties. Fevers which have reſiſted red Bark, give way to this very eaſily. The firſt parcel which arrived here, was tried at Madrid, and was immediately bought by the King's order for his own uſe. We alſo found means to procure a few hundred pounds of it, in order to make experiments here as well as in France, and had every where the greateſt ſucceſs."

Here we find a perfect coincidence with Murray's account, which ſtates that this bark on being diſcovered to be more efficacious than the other ſpecies, was reſerved for the uſe of the Royal Family of Spain, and hence he diſtinguiſhed it by the name of *Royal Yellow Bark.*

In what part of Spaniſh America the ſpecies of Cinchona producing the yellow Bark grows, we have no ſatisfactory information; all that is known by the drug merchants at Cadiz, is contained in the following letter: "The yellow Bark was not conveyed to Lima by ſea, like the other kinds of bark, but was found only at the diſtance of two or three hundred leagues from the capital, and was obliged to be brought over ſteep, and almoſt inacceſſible mountains, a circumſtance which will prevent the reduction of the price, and make it come at 6 and 6 5-8 rials of 16 quarts, at Lima. Theſe particulars have been confirmed to us by many people, who have inhabited thoſe parts, ſo that we fear not to give you them

as true. The repute which this bark had got, was likely to bring a great quantity; we were the firſt that bought any, and we paid three piſtoreens, but it having been ſold in France for two louis d'ors, it roſe here to ſix and ſeven piſtoreens; we afterwards bought ſome at twenty-four and twenty rials. The profit that this advantageous price offered, tempted the inhabitants of Lima to try every effort to procure ſome and ſend it here. But from the calm which has reigned ſince in this article, and the loſſes ſuſtained by the preſent ſales, it may be depended on, that no new expedition will be effected, and that they cannot eaſily be renewed. There muſt not only be great preparations, but alſo a long interval of time to

procure this bark at the diſtance it is found from Lima."

On the authority of this letter, which I received from a perſon of unqueſtionable integrity, it is evident, that the yellow Peruvian Bark tree grows in the interior parts of Spaniſh America, in a mountainous country, and at ſuch a great diſtance from Lima, that the expence of conveying it thither muſt be very conſiderable; conſequently the merchant cannot obtain it, but at a higher price than that of the other ſpecies of Cinchona, which are found much nearer the capital of Peru: and hence the yellow Bark has been ſold at a much dearer rate than the other barks, which fully

certifies the great reputation it ſuſtains at Peru.

It is well known to druggiſts, that the moſt valuable bark is brought to Europe in what are called half cheſts, and the yellow Bark has not only this preſumptive indication of its goodneſs, but its epidermis, or external coat, is ſtripped off, evidently at the expence of much manual labour; ſo that nothing but the efficient part of the bark, or the real liber, remains; for whatever may be thought of the outer coat of the bark, experiments prove it to be an inert ſubſtance, and totally void of medicinal power; therefore in the ſmall quilled Bark, in which the quantity of

this uſeleſs external matter bears ſo conſiderable a proportion to the true liber, an adulteration muſt neceſſarily take place on powdering it, and thereby the neceſſary doſe will be rendered more bulky and leſs efficacious. In this obſervation I include not only the proper epidermis, and the lichens with which it may be covered, but alſo the exterior part of the liber itſelf, which, in the older bark, becomes black and effete to a conſiderable extent. The large yellow Bark, therefore, from being freed of all this extraneous part, poſſeſſes the advantage of being compoſed of a larger proportion of active and ſoluble matter.

From the accounts of Arrot,

Condamine, and Juſſieu, it is manifeſt, that the goodneſs of the different ſpecies of Peruvian Bark, was found to be always in proportion to the deepneſs of its colour: thus the red was moſt valued, and the virtues of the white, pale, and yellow, yielded ſucceſſively to each other. But admitting this obſervation to its utmoſt extent, the yellow Bark ſhould now be preferred to any other which has lately been imported into Europe; for the true red Bark ſo fully deſcribed and recommended by my learned friend Dr. Saunders, has all been conſumed ſome time ago, and notwithſtanding the increaſed demand for this ſpecies, the drug merchants found it impoſſible to procure of it a ſecond importation of

the ſame quality; and though much bark is ſtill ſold under this name, yet, upon examination, it is found evidently inferior to the original red Bark. Beſides, the Bark to which I here call the attention of medical practitioners, though named yellow, is in reality of a deep or dull orange colour, approaching nearly to the ruſt of iron, and on being a few days expoſed to the light, acquires a ſtill darker colour than the red Bark; therefore, ſo far as colour may be deemed a teſt of comparative ſuperiority in the goodneſs of the Peruvian Bark, this ſpecies has ſtill a claim to ſuperior excellence.

Another objection which may poſſibly be offered to the yellow

Bark, is, its want of odour, or what has been termed aroma. In reply to this, I am happily enabled to do away a prejudice which has long prevailed on this ſubject. Authors have generally expreſſed the ſmell of the Cinchona Bark by the word muſty, and the term is perfectly appropriate. With a view to inveſtigate the ſeat of this principle of odour in different ſpecimens of common bark, I had recourſe to experiments, from which I ſoon perceived that thoſe pieces moſt beſet with lichens, and inveſted with a blackiſh epidermis, gave out the moſt of this muſty ſmell. This I was led to expect, from a converſation which I had with the Preſident of the Linnean Society, in which he ſuggeſted, that the

ſmell of the Peruvian Bark might probably reſide in its extraneous covering, the truth of which has ſince been confirmed by experiments. For, upon carefully ſeparating the external matter from the liber, the latter was completely devoid of ſmell; conſequently the yellow Bark, when diveſted of its outer coat, is alſo with this diveſted of its odour; and in ſmall quilled yellow Bark (of which I have ſeen ſome cheſts) covered with its epidermis, the ſmell is nearly the ſame as in the other quilled ſort.

The great thickneſs to which the principal part of the yellow Bark extends, muſt, as in the red Bark, be conſidered as a proof of

its greater perfection, eſpecially when ſeparated from the outer effete, and decayed matter.

The Bark of the large part of trees, in which the proceſs of vegetation is more perfect, not only conſiſts of a greater number of layers, but theſe are conſtituted of more efficient matter. Thus, according to Seba, the bark of the cinnamon tree does not acquire its full flavour till it be of ſeven years growth; and it is well known to tanners, that the bark taken from the trunk of the oak, is more efficacious than that taken from the ſmall branches; therefore unleſs in the Cinchona, this general principle and order of nature were inverted, a preference ought certainly

to be given to the thicker and more fully formed bark. It is true, that on examining a cheſt of Peruvian Bark, pieces vary much in all their dimenſions, and even different ſpecies of Bark are intermixed in the ſame cheſt, but the name of that ſpecies which is moſt abundant attaches to the whole cheſt.

The preceding obſervations on the colour, odour, and ſize of Peruvian Bark, will, it is preſumed, have ſome influence with the medical practitioner, though, perhaps, not ſufficient, to overturn long eſtabliſhed opinions; for, as in former times, Liſter preferred the thick, and Morton the ſmall Bark, ſo at this day, a diverſity of opinion on this point does and will prevail.

However, as enough has been ſaid concerning the external characters of this bark, to ſhew that none of them render it incompatible with thoſe of the beſt Peruvian ſpecies; I ſhall now proceed upon the experimental part of this inquiry, to which the cautious reader will naturally look for ſtill more deciſive and unequivocal proofs of the efficacy of the yellow Peruvian Bark.

The reſults of the various chemical teſts to which the yellow Bark was comparatively put, with thoſe of the beſt red and quilled Bark, clearly demonſtrate, that the powers of the two latter ſpecies were uniformly ſurpaſſed by thoſe of the former throughout all the different

trials which it was thought neceſſary to inſtitute.

Theſe experiments were projected and entirely conducted by my eſteemed friend Mr. Babington, a circumſtance from which I derive great ſatisfaction, as he is a man whoſe ſcientific knowledge of chemiſtry is generally acknowledged, and of whoſe accuracy and fidelity no doubts can ariſe; I ſhall therefore relate the experiments in his own words.

"In this communication you have a ſhort but faithful detail of ſuch obſervations, and the reſults of ſuch experiments, as I have already made on the yellow Peruvian Bark; and as all that I have hitherto done

has been conducted on a large ſcale, and under the daily inſpection of many gentlemen, as well as yourſelf, no otherwiſe intereſted on this occaſion than in the gratification of profeſſional curioſity, I hope, ſo far as my inquiries have extended they will be found ſatisfactory. If, in your intended publication, you can make the following experiments in any degree ſubſervient to your own uſe, or the general advantage of ſociety, I ſhall think myſelf fully recompenſed for all the time and trouble they have coſt me."

Of the Decoction of the Yellow Bark.

"The decoction of this, like that of the common Bark, is, whilſt

hot, tranſparent, and of a browniſh colour. Upon cooling, it becomes turbid, and changes to a yellow. If it be made in the ſame proportion with the decoctum Cinchonæ of the London Pharmacopœia, it is difficult by the eye, to diſtinguiſh the one, from the other: but on a more particular examination they are found to differ very widely. The decoction of common Bark, as every one knows, is both bitter and aſtringent; has a particular flavour, which many have thought fit to expreſs by the term aromatic; keeps for ſeveral days in a moderate temperature, without undergoing any material alteration; and, upon the application of iron in any of its ſoluble forms, it becomes additionally turbid, and

yields a dark precipitate. In all theſe reſpects, except with regard to flavour, the decoction of yellow Bark is decidedly ſuperior, not only to the common, but even to that of the ſoundeſt and moſt genuine red Bark. I have diluted the decoction of yellow Bark with twice its quantity of water, and found it fully as bitter as the decoction of the beſt common bark made at the ſame time, and exactly under ſimilar circumſtances; whilſt, on another occaſion, comparing the bitterneſs of the decoction of yellow, with that of red Bark, the former appeared greater than the latter, in the proportion of two to one. The difference is equally remarkable in the aſtringency of theſe decoctions, the yellow, the common, and the

red; to equal quantities of which, if a ſolution of vitriolated iron be added, till no further decompoſition enſue, there will be produced in the firſt, a darker and much more copious precipitation than in either of the other two; and when a pint of each was taken and ſet by in common quart bottles, which was done in the month of December, and theſe afterwards from time to time examined with regard to their ſoundneſs, it was found, that the mouldineſs and acidity obſervable in the common, in three, and in the red, at the end of ſix weeks, had not taken place in the yellow for nearly two months."

"This new ſpecies of Bark appears to me to have little ſmell;

in decoction alſo it is leſs odorous than in that of all the other kinds of bark with which, in the courſe of examination I have hitherto had occaſion to contraſt it. But before we draw an unfavourable concluſion from the deficiency of this quality, upon which many are diſpoſed to lay particular ſtreſs, it will be neceſſary firſt, to aſcertain in what parts of the Bark this property reſides."

"For my own part, I am diſpoſed to believe, as firſt ingeniouſly ſuggeſted by the learned Dr. Smith, that the odour of Bark is more independent of its active parts than is commonly imagined; that is to ſay, that it belongs not ſo much to the internal, ſubſtantial, and effica-

cious ſtrata of the ſubject, as to the moſſy vegetations which grow upon the ſurface, and which, together with the old epidermis, conſtitute its natural covering. For I find, that when this is carefully ſeparated by raſping, or any other mechanical means, this property is materially leſſened."

"Bark, when covered with its epidermis, and diſtilled with water, yields a colourleſs liquor, manifeſtly poſſeſſing the flavour of its cuticle; but if it be previouſly diveſted of this external covering, this flavour is certainly much leſs obſervable. Hence we come at a very ſatisfactory explanation of the variety in different kinds of Cinchona, with regard to this ſenſible

property; and more eſpecially why the Cinchona flava, naked as it uſually is, ſhould poſſeſs ſo ſlight a degree of odour."

"The decoction of common Bark appeared to Dr. Percival to be an injudicious preparation; "for though, (ſays he) the cortex is not a ſubſtance of much volatility, yet there is a certain aroma accompanying it, which the heat of boiling water cannot fail to diſſipate, and conſequently the medicine is deprived of one of its component parts, in which, probably, ſome ſhare of its virtue reſides."

"Dr. Skeete, in his experiments and obſervations on Peruvian Bark, commences the experimental part

of his treatiſe with an inquiry into the volatility of the ſubject, and thought it particularly neceſſary ſo to do, "ſince moſt writers laid great ſtreſs on the ſuppoſed aroma, and condemned certain forms of the bark from the idea, that it was diſſipated during their preparation." The concluſion is, "that the ſlight ſmell of the condenſed liquor, in the diſtillation of bark, aroſe from a few of the finer reſinous particles which are raiſed by the heat, and are more numerous in proportion as it is more quickly applied."

"It is obvious therefore, that neither of theſe phyſicians, nor indeed any other I am acquainted with, had the leaſt ſuſpicion of the preſence of the moſſy impregnation

I am ſpeaking of. On this head I have only further to add, that, independent of the cortical or moſſy flavour, I do not find that a decoction of Bark in general is ſo eaſily decompoſed in boiling, as, from the opinion of medical authors, I was at one time diſpoſed to believe. To be the more ſatisfied of this, I have kept meaſured quantities of different kinds of decoctions under briſk and conſtant ebullition, for upwards of ten hours, but have never obſerved any material diminution either in their bitterneſs or aſtringency. This leads me to conclude, that thoſe who have aſſerted the contrary, were deceived, and had inferred a change in thoſe properties, from a diſſipation of the odour, or what is more probable,

had employed metallic veſſels which had been acted upon during the operation."

Of the Infuſion of Yellow Bark in hot and in cold Water.

"When the powder of this bark has been macerated in boiling water, in the uſual proportions, and for the uſual length of time, it communicates to it, as other barks do, the properties of a weak decoction. The infuſion if filtered, whilſt hot, is of a light brown colour, tranſparent, bitter, and aſtringent; upon cooling, it changes colour, and becomes turbid, and by the addition of vitriolated iron, undergoes the ſame alteration as the decoction, though obviouſly in a leſs degree.

If, inſtead of being macerated in hot water, the powder be either triturated with cold water, in the manner particularly ſpoken of by Dr. Percival, or infuſed in it in the common way, for the ſpace of twenty-four hours, the liquor receives a very ſtrong impregnation, not ſo much from the aſtringency, as from the pure and intenſe bitterneſs of the ſubject."

"Two circumſtances, in the pharmaceutic hiſtory of this article, which have in a particluar manner engaged my attention, are, the predominancy of its bitterneſs when compared with other barks, and the determined fixity with which it ſeems attached. Theſe are ſuch, that it appears to me doubtful

whether it is poſſible by an aqueous menſtruum to extract all its bitterneſs without the aſſiſtance of heat. For, being deſirous of ſeeing how far an extract of the cold infuſion of yellow Bark would reſemble the foreign Peruvian extract, lately held in great eſtimation, I took for this purpoſe five pounds of the fineſt powder, and at the end of eleven days, when I had uſed above one hundred gallons of water, I found the powder was ſo far from being inſipid, that it was ſtill as bitter as the common powdered bark of the ſhops. The water in which the bark had been infuſed, on being filtered, and evaporated by the heat of a water bath, yielded fifteen ounces of extract, of a dark brown colour, and pillular conſiſt-

ence; extremley bitter, and poſſeſſing a certain degree of tranſparency."

"Of the experiments comprehended under the head of infuſion, I conceived it of conſequence to attend to the effects of magneſia, which, on common and red Barks have been found ſo materially different. We are informed by Dr. Skeete, and the fact is univerſally admitted, that when magneſia, whether pure or aërated, is triturated with the powder of common bark, and water gradually added, ſo as to reduce the mixture firſt into a paſte, and afterwards to render it fluid, the infuſion paſſed through filtering paper, is of a much deeper colour, more bitter

and aſtringent to the taſte, produces a more copious precipitation on the addition of vitriolated iron, is of greater ſpecific gravity, and much more powerfully antiſeptic, than an infuſion of the ſame bark, made with the water only. But if the powder of red Bark be ſubmitted to a ſimilar treatment, neither common nor calcined magneſia is obſerved to occaſion any alteration. This difference in the action of this eartly ſubſtance upon common and red Bark, would ſeem, as the Dr. obſerves, to point out a difference in the nature of their conſtituent parts, which we are not capable of detecting by means of other experiments. The infuſion of yellow Bark with magneſia, has properties peculiar to

itſelf. If two parts of yellow Bark in fine powder, be mixed with one part of pure, or an equal quantity of aërated magneſia, and made into an infuſion, by the gradual addition of ſixteen parts of pure water; the liquor, when filtered, though ſomewhat deeper in colour, will not be found in taſte either ſo bitter or aſtringent, as if no magneſia had been uſed; and yet when equal quantities of the ſimple and magneſian infuſions are examined by means of a chalybeate ſolution, in the firſt, the change of colour is ſlow, in the other an immediate blackneſs, as well as a more copious depoſition take place. From which I think it is obvious, that whatever be the nature of the bitterneſs and aſtringency of bark, con-

ſidered as ſeparate principles, they vary in different ſpecies, not only with regard to their proportions, but alſo in their mode of combination. The effects of magneſia, in the preſent inſtance, I conſider as analagous to thoſe which Mr. Scheele has ſtated, to be produced by lime upon benzoin; in which caſe, a union takes place between the calcareous earth and the vegetable ſaline part, commonly called the flowers of benzoin; ſo here, the aſtringent and bitter principles of the bark are chemically combined with the magneſia; occaſioning a concealment of their properties, which, on ſubſequent decompoſition, may be recovered unimpaired. Even in the ſame ſpecies of bark I

conceive it very poſſible, that the ſapid principles may differ eſſentially as to their mode of exiſtence, more eſpecially with reſpect to aſtringency. In a ſubſtance ſo compounded it ſeems not unreaſonable to ſuppoſe, that the principle of aſtringency, may be either united with ſome other conſtituent part, and thereby become chemically altered; or that it may exiſt in a ſeparate form, looſe and unreſtrained, ready therefore on all occaſions to exert its particular effects: or laſtly, like the phoſphoric acid in urine, it may be partly in a ſtate of combination and partly looſe, as would appear to be the caſe in thoſe experiments, where, after rendering bark completely inſipid

by one menſtruum, we can extract additional aſtringency by another.

It depends probably, more upon the peculiar effects of heat, than upon a diſproportion in the ſtrength of the preparations, that the infuſions of every kind of bark become ſo much ſooner mouldy than their reſpective decoctions. The cold infuſion of common bark can ſeldom be preſerved for more than two or three days, without undergoing this change; and in that of the red and yellow it is generally obſervable in the ſpace of a week; this differs very widely from what has been already ſtated, with regard to their reſpective decoctions. We have many examples of the

influence of a boiling heat in the preſervation of vegetable liquors; none perhaps are more remarkable than in the caſe of vinegar, which we are told by Mr. Scheele, may be kept for any length of time, by putting it into common bottles and heating it in a water bath.

Of the Tincture of Yellow Bark, in Proof and Rectified Spirit of Wine.

In the preparation of the ſimple tincture of common bark, the College of Phyſicians directs, that ſix ounces of this ſubſtance in powder, ſhould be digeſted with a gentle heat for eight days, in

a quart of proof ſpirit. The powder of yellow Bark employed in this way, produces a tincture in colour and tranſparency differing very little from the above, but ſo far ſurpaſſing it in bitterneſs and aſtringency, that the ſmalleſt portion of each is ſufficient for their immediate diſtinction; equally eaſy is it to decide that, notwithſtanding the richneſs of colour, it ſurpaſſes even the tincture of red Bark, in both the foregoing properties.

Having taken particular pains in the preparation of theſe different tinctures, I was not a little ſurpriſed to find, on examining their ſpecific gravity; not that the tincture of yellow Bark was

heavier than that of common Bark, for this I naturally expected; but that the tincture of red Bark ſhould be lighter than either of the others. Their proportions were the following:

Tincture of yellow Bark,	918
——— common Bark,	912
——— red Bark,	911⅘

In correſpondence with theſe reſults, upon evaporating a pint of each of theſe tinctures in a water bath, the firſt yielded 311, the ſecond, 210, and the third, only 201 grains of ſolid reſiduum. It would appear, therefore, I think, highly probable, that the red Bark now in uſe, and of which I had provided the ſoundeſt and

moſt perfect ſpecimens, is not, in point of ſtrength or product, equal to what it originally was. For, according to Dr. Skeete's experiments, which were made when the firſt importation of this article was in general circulation, a phial, containing about two ounces by meaſure, of the tincture of this in proof ſpirit, weighed two grains more than a tincture of common bark in the ſame ſpirit, made for the purpoſe of compariſon. The tincture of yellow Bark in rectified ſpirit, differs chiefly from that in proof, by being of a lighter colour, and more intenſely bitter to the taſte. It has very nearly the ſame ſhade as a tincture of common Bark in rectified ſpirit. In alcohol the co-

lour is lighter, with purer bitterneſs, but a much leſs degree of aſtringency. When a certain quantity of bark in powder, has been digeſted in repeated portions of pure ſpirit, it becomes completely inſipid, and loſes nearly one third of its quantity; but, notwithſtanding, that neither to the ſmell nor taſte is there the ſmalleſt flavour, bitterneſs or aſtringency diſcernible; yet upon making a decoction of the reſiduum in water, the filtered liquor changes colour, and becomes immediately turbid upon the addition of a chalybeate ſolution. This is one of the examples alluded to, in hinting at the poſſibility, that aſtringency might be ſuch a principle as in the ſame

ſubject admitted of different modes of exiſtence. Having had occaſion to attend particularly to the menſtrual power of ſpirit, in contraſting the tinctures of yellow Bark with thoſe of the common and red, I could not help being ſurpriſed, that Dr. Lewis ſhould have been contradicted in his aſſertion, that proof-ſpirit extracts leſs from bark than rectified ſpirit, but more than water. The ſolvent power of the former, is ſtated by Dr. Skeete, to be inferior to the latter in the proportion of at leaſt three to one. When yellow Bark, in ſubſtance, is ſubmitted to diſtillation with water, the flavour of the ſubject may be ſaid to be barely diſtinguiſhable, but in the diſtillation of its tinctures, there

ariſes not the ſlighteſt impregnation."

"Dr. Lewis was of opinion, that the aſtringency of bark reſided wholly in its reſin; its bitterneſs in a gummy reſinous ſubſtance, ſoluble both in water and ſpirit. Dr. Skeete believed, that both the bitterneſs and aſtringency belonged to the reſin only, and that the mucilage or gummy part was of a ſimilar nature with that of common gum arabic. The reaſon of mentioning theſe opinions is, that they have led to an experiment by Dr. Skeete, about which I have never been ſatisfied."

"The Doctor ſtates, that having taken three ounces of tincture of

bark, partly prepared with proof, and partly with rectified ſpirit, he added to them ſix ounces of water, and decanted off the clear liquor as ſoon as the reſin had ſubſided. Succeſſive quantities of water were then employed in a ſimilar manner, till they ceaſed to diſſolve any portion whatever of the bark, being thoroughly void of taſte, as well as colour. The pure reſin was now mixed with about twenty grains of gum arabic, and having added four ounces of water, they were boiled for a ſhort time over a ſlow fire. When the mixture had cooled ſufficiently, he examined it, and found that by means of the mucilage, the greateſt part of the reſinous precipitate had been diſſolved. The liquor was high coloured, exceed-

ingly bitter, and, upon the addition of a chalybeate, it aſſumed a dark colour, and became very turbid."

"It is undoubtedly true, that when a quantity of water is added to a tincture of bark in pure ſpirit, a reſinous depoſition will enſue, which, be it ever ſo carefully waſhed, will ſtill retain a certain impregnation of the original concomitant principles, but in ſo ſmall and inadequate a proportion, that the foregoing inference cannot, I conceive, be admitted. Neither do I ſee any reaſon, why bitterneſs and aſtringency ſhould be referred to gum or reſin, more than ſugar or acid, or any other conſtituent part of vegetable matter."

Of the Aqueous and Spirituous Extracts of Yellow Peruvian Bark.

" There being in general in the pharmaceutic treatment of bark, particular attention paid to the properties and produce of its extract, I have therefore, with regard to this part, endeavoured to be more eſpecially attentive. It has been already ſaid, that from a cold infuſion prepared from five pounds of yellow Bark, there were obtained fifteen ounces of extract of a dark brown colour, ſomewhat tranſparent, and extremely bitter. In this experiment however, the object was not ſo much to aſcertain the quantity as the kind of extract which a cold infuſion would produce. The

College orders two kinds of extract; one made by boiling a certain quantity of the bark in repeated portions of water, ſtraining the decoctions whilſt hot, and evaporating them to a proper conſiſtence; the other, by digeſting firſt in rectified ſpirit, then making a decoction of the reſiduary matter in water, and uniting the products after each liquor has been ſeparately evaporated. According to the firſt proceſs, ten pounds of yellow Bark yielded four pounds and two ounces of extract, of a pillular conſiſtence, (for the watery extract of bark is directed in a double form; ſoft, or of a proper conſiſtence for being made into pills; and hard, ſo as to be reducible to powder.) Ten pounds of red Bark yielded four

pounds one ounce of extract, of the ſame conſiſtence; and ten pounds of common Bark yielded but two pounds nine ounces. All theſe extracts are opake, of a dark brown colour, very bitter and aſtringent, and perfectly free from empyreuma. The common, appears to be the ſmootheſt and moſt plaſtic; the red the moſt brittle; the yellow is of a lighter colour than either of the others, and far more powerful in taſte. Of the reſinous extracts the products are different. By the uſe of both water and ſpirit, a pound of common Bark yields only two ounces three fifths; a pound of red Bark two ounces ſix eighths; and a pound of yellow Bark no leſs than four ounces, which agrees in a great

meaſure both with the former ſtatement, and the produce of the evaporated tinctures. The reſinous extract of yellow Bark is rather of a lighter colour than the aqueous; it has likewiſe a certain degree of tranſparency, but in its other properties, except with regard to ſolubility, there is no remarkable difference."

"How neceſſary it is to be particular in the conduct of ſuch preparations, may be ſeen in an experiment by Dr. Percival, where the aſtringency of a watery extract is ſaid to be inferior to that of an infuſion of the bark by trituration; which certainly could not have been ſo ſtated had the extract been good."

"But as far as I have had an opportunity of judging, the pureſt and moſt elegant extract is not to be obtained from this bark, by either of the foregoing proceſſes. What appears to me preferable, is to digeſt it firſt in rectified ſpirit, which I conſider as the moſt perfect menſtruum, and after filtering the tincture, to diſtil off the ſpirit in a balneum. By this ſimple method of proceeding, whatever be the virtues of the ſubject, the extract muſt of neceſſity contain them. On the one hand, the bark is rendered completely inert, on the other, the ſpirit is brought over without the ſlighteſt trace of impregnation. The produce of ſuch ſpirituous

extract is, three ounces from twelve of the bark. In its appearance it very much reſembles the foreign Peruvian extract, which, I have no doubt, is alſo a ſpirituous preparation, and though exceedingly powerful both as to its bitterneſs and aſtringency, it poſſeſſes a peculiarity of flavour, to many by no means unpleaſant."

"In the preparation and ſubſequent examination of theſe extracts, I have had a particular view to an analyſis of red Bark publiſhed a few years ſince by Monſ. Fourcroy, in which the properties of that bark are contraſted with thoſe of the Quinquina of St. Domingo, which this celebrated

chemiſt ſelects as an example of dry vegetable matter in general. After making an infuſion of the powder of red Bark in water, and endeavouring to ſhew that it contains a peculiar acid; Mr. Fourcroy next attends to the changes it undergoes on boiling. By repeated decoction in water, he extracts from a certain quantity of the bark, the whole of its ſenſible properties; then, by a cautious evaporation, during which time the liquor is twice allowed to cool, he collects all the ſolid contents. Theſe amount only to a ſixteenth part of the whole, and on being rediſſolved in diſtilled water, ſhew ſigns of acidity. Mr. Fourcroy further ſtates, that the ſolution of this

watery extract, as it may be called, on being mixed with lime water, gives out a volatile alkaline odour; that it yields an earthy precipitate on the addition of a ſolution of pot-aſh; and on being evaporated to dryneſs furniſhes muriatic acid, by means of the acid of vitriol. From theſe and many other experiments, the general inference is, that, water extracts from bark, a ſmall quantity of ſaline matter, a little mucilage, and, a reddiſh brown extractive reſinous ſubſtance, the properties of which are very different from thoſe of any other extract we are acquainted with. That this ſubſtance preſents itſelf under different forms, from that of a reſinous extract, to reſin of the

pureſt kind, according to the proportion of the pure air or oxygen with which it has had an opportunity of combining. Hence the difference in the qualities of infuſions, decoctions, and extracts. That it is this which ſeparates, when a decoction of bark is allowed to cool, and by appearing ſometimes in the form of a brown inſoluble powder, has either been taken for an earth, or for a decompoſed reſin. However, upon a repetition of moſt of Mr. Fourcroy's experiments, I am ſorry to ſay, that the reſult has by no means correſponded with what this ingenious chemiſt has ſtated; on the contrary, I am thoroughly perſuaded, that the materials which

he employed in his analyſis were either originally bad in their kind, or that he had allowed them to ſpoil before his obſervations were made on them."

"With regard to the more immediate ſubject of this letter, I have at preſent little further to add. On ſo new and intereſting an occaſion there will probably be many opinions, and much ſtill remains to be done. So far however, it already appears very plainly, that if there be a proportionate connexion between the medical effects and the ſenſible pharmaceutic properties of the Peruvian Barks, the yellow ſpecies of it cannot fail to be a remedy ſuperior

in efficacy to all the others. Whether it is ſo in reality experience alone muſt determine. I can take upon myſelf to ſay, that in all its forms it may, as a general remedy, be as ſafely and as freely employed, as any other kind of bark we are acquainted with. And from the many caſes in which I have myſelf ſeen it given with ſucceſs, as well as from the favourable accounts I have received of it, from ſeveral of my moſt reſpected friends; I doubt not, but that it will ſhortly be much ſought for, and held in very general eſtimation.

"I refer more eſpecially to Dr. John Lind, of the Royal Hoſpital, Haſler; Dr. James Curry, of

Kittering, Northamptonſhire; Mr. Richard Stocker, Titchfield Hampſhire; Mr. William Gaitſkill, Rotherhithe; and Mr. Lancelot Hare, Southminſter, Eſſex; who have done me the favour to make this new ſpecies of bark the ſubject of particular obſervation, and whoſe reports reſpecting it you will have great ſatisfaction in conſulting."

I am, &c.

W. BABINGTON.

From what has been advanced in this Inquiry, reſpecting both the natural and chemical properties of the yellow Peruvian Bark, I truſt every impartial reader muſt be convinced, that it promiſes to be of important uſe to the medical practitioner. For, by examination and compariſon of the barks of the various ſpecies of Cinchona with each other, we learn, that the ſenſible qualities of this bark are perfectly reconcileable with thoſe of the beſt kind; while a chemical inveſtigation of it, on which moſt reliance is to be placed, has proved it to contain a greater proportion of efficient and ſoluble matter, than the beſt pale, or even red bark now in uſe.

Though this might be conſidered by many as a ſufficient proof of the ſuperior efficacy of the yellow Bark, yet it was ſolely from actual trials of its effects in diſeaſe, producing the moſt ſucceſsful reſults, that determined me to recommend the drug to public notice. I ſhould however have had leſs confidence in my own obſervations and experience, had not all the chemical teſts to which the yellow Bark has been ſubjected, afforded a very ſatisfactory collateral evidence of its active powers.

To attempt to explain the *modus operandi* of Peruvian Bark, in the cure of diſeaſe, would lead me into a wild and ſterile field of theory and hypotheſis, which has been

long, and in my opinion unprofitably cultivated by others.

The principal, and probably the only efficient qualities of the bark, are its bitterneſs and aſtringency; but whether it acts ſimply by the union of theſe two properties, or by ſome peculiar combination or modification of them, or whether its efficacy depends upon a power ſui generis, or what has been called a ſpecific quality, is a queſtion not yet fully decided. Thoſe who maintain the former opinion, contend, that the medical powers of the bark are proportioned to its ſenſible qualities; while the advocates for the latter opinion aſſert, that no artificial compoſition of bitter, aſtringent, and other mat-

ters, though infinitely more powerful than thoſe found in the Cinchona Bark, is of equal efficacy in the cure of agues. However, as bitterneſs and aſtringency are admitted by all to be the only oſtenſible evidence of the medicinal utility of Bark, and without which it would be deemed uſeleſs and effete; it may be fairly inferred, that the yellow Bark, as poſſeſſing theſe qualities in the greateſt degree, ſhould be employed in preference to that of any other ſpecies of Cinchona.

Much has been ably written on the ſubject of the Peruvian Bark, and the different caſes indicating its uſe, have not only been fully pointed out, but alſo the moſt effectual way of exhibiting it, has

been ſtated by phyſicians of great profeſſional experience; and by none more judiciouſly than by my friend Dr. Saunders.

It would be ſuperfluous therefore to enter upon an examination of the various diſorders requiring the yellow Bark, which is not conſidered here in a new character, but as only poſſeſſing the medical powers of common Bark in a greater degree.

The febrifuge power of the Peruvian Bark, or that by which it ſtops the recurrence of febrile paroxyſms, firſt eſtabliſhed its importance; and by the comparative ſmallneſs of the quantity of the bark required to produce this

effect, we are, ceteris paribus, beſt enabled to eſtimate its goodneſs or relative efficacy. It is true, that ſome intermittent fevers are infinitely more ſevere and leſs tractable than others, as depending upon the ſeaſon of the year, and the nature and conſtitution of the patient. Thus a mild vernal ague may be cured, not only by the leaſt efficacious of the Peruvian Barks, but alſo by various other bitter and aſtringent vegetable ſubſtances. While on the other hand, intermittents ſometimes occur, in which large and repeated doſes of the moſt powerful ſpecies of the Peruvian Bark, have been found ineffectual, and hence arſenic and ſuch like violent remedies have been reſorted to.

I truſt, however, that from the general and ſucceſsful experience which I have had with the yellow Bark in many inveterate agues, it will ſeldom if ever be found neceſſary in ſuch caſes, to employ any other febrifuge.

At Guy's Hoſpital I have had frequent opportunities of treating agues of every deſcription, for though this diſeaſe does not very frequently originate in London, yet it is often brought into the metropolis, eſpecially with the poorer orders of the community.

The labourers employed at the harveſts in the fenny parts of Eſſex, and the hop-gatherers in Kent, annually ſupply the Hoſpital with a

number of patients in every type and ſtate of intermittent fever; from which, both my colleagues and myſelf have had ample experience of the effects of yellow Bark. And I am authoriſed by Dr. Saunders and Dr. Hervey, to ſay, that in the various caſes in which this drug was uſed by them, it proved invariably ſucceſsful; nor has my own practice furniſhed me with a ſingle exception.

I have repeatedly preſcribed this bark in the various forms of powder, decoction, and extract, on each of which it may be neceſſary to make ſome obſervations.

Bark in the form of powder, is for obvious reaſons juſtly conſidered

the moſt efficacious form in which it can be adminiſtered. Half a dram of the yellow Bark in this ſtate, given every two hours, has in general been found ſufficient to cure in a few days the various intermittents which have fallen under my care, excepting only ſome peculiar caſes evidently connected with viſceral obſtructions, in which I not only had recourſe to calomel, but alſo found it expedient to increaſe the doſe of the bark. Judging however from a great number of caſes, I am perfectly ſatisfied that the yellow Bark manifeſted nearly a double proportion of febrifuge power to that of the common Bark; as moſt of the agues treated at the Hoſpital, were not to be ſubdued by giving

leſs than a dram of the latter bark every two hours.

It has been hinted to me, that the bitterneſs of the yellow Bark is ſo intenſe, that few ſtomachs would bear a large doſe of this drug without nauſea and ſickneſs being induced; but this opinion is wholly unfounded and contradicted by experience.

Its bitterneſs, though certainly exceſſive, is however not of the nauſeous kind, and has in many inſtances proved more acceptable to weak dyſpeptic ſtomachs, than an equal quantity and a ſimilar preparation of the common Bark. Therefore this quality of yellow Bark, on which much of its effi-

cacy probably depends, gives it peculiar and important advantages, which ſhall be noticed more fully hereafter.

But while we admit that the bark may be adminiſtered moſt efficaciouſly in ſubſtance, yet in ſome conditions of the ſtomach, the powder of none of the ſpecies of this drug can be taken in ſuch large and repeated doſes, as many intermittents require; beſides, a conſiderable degree of nauſea and ſickneſs often accompanies theſe diſorders through all their ſtages. It therefore becomes neceſſary to employ ſome other preparation of this medicine, more likely to agree with the ſtomach, and in which the doſe of the bark is

not unneceſſarily enlarged by any of its effete and inſoluble matter; for I conceive that in moſt inſtances, it is owing rather to the quantity than to the quality of this ſubſtance that it offends the ſtomach.

This leads me to ſpeak of the decoction of the yellow Bark, which though ſtrongly impregnated with the ſapid principles of the drug, has not been found more diſagreeable to the organs of digeſtion, than that prepared from the common Bark.

This obſervation to many may appear ſomewhat paradoxical, but when we conſider that the nauſeouſneſs of medicines, is far from

being proportioned to the intenſity of their bitterneſs, a principle of analogy ariſes perfectly reconcilable with the fact here ſtated. Indeed I have never obſerved, that the decoction of yellow Bark was by thoſe who took it, complained of as unpleaſant, though I have known a quart of it to have been drunk, between the hours of breakfaſt and dinner.

The experiments of my friend Mr. Babington clearly ſhow, that the decoction of the yellow Bark reſiſts the putrefactive tendency a much longer time, or is more antiſeptic than that prepared from the common or red Bark, and this is certainly to be regarded as one of the many proofs of its ſuperior efficacy.

But my experience enables me to ſay, that moſt intermittents which occur, may be completely cured by this decoction, and that in a general way, it will be found an effectual and pleaſant ſubſtitute for the powder. I muſt confeſs, however, that thoſe agues which have occurred to me in private practice, and where I have been particularly ſolicituous to avert a ſubſequent paroxyſm of the fever, I have commonly directed ten grains of the powder to be added to an ounce and half of the decoction, and by giving this every two hours, I have never been diſappointed in preventing the uſual return of the diſorder.

In remittent fevers, typhus, and other continued fevers, the decoction of the yellow Bark has alſo been ſucceſsfully employed; and to theſe I may likewiſe add acute rheumatiſm. For though this laſt diſeaſe is manifeſtly of the inflammatory kind, yet a remiſſion of the febrile ſymptoms generally takes place to a degree more or leſs evident, in the courſe of every diurnal revolution. In ſuch caſes I have no heſitation in ſaying, that, notwithſtanding the ſizineſs of the blood, and the continuance of the inflammatory ſymptoms, bark may be ſafely and efficaciouſly employed: and under ſuch circumſtances I have uſually had recourſe to the frequent and free exhibition of the yellow Bark

during the day, and previous to the evening exacerbation; which I have found to be a very ſucceſsful practice, and for which I am indebted to Dr. Saunders, who has adopted it many years, and frequently cauſes the Bark to be accompanied with both general and topical blood-letting.

In ſcarlatina, eryſipelas, and in ſhort in all the common diſorders either acute or chronic, requiring Peruvian Bark, I have had much experience with this new ſpecies of it, eſpecially in the form of decoction; from all of which I am fully convinced that on every conſideration, it ſhould ſuperſede all the other kinds of Cinchona Bark now in uſe.

The great bitterneſs of this bark gives it a peculiar advantage in bilious and dyſpeptic diſorders, and I conſider that in the ſtate of infuſion, it may prove an efficacious ſubſtitute for all the medicinal bitters. Its bitterneſs is ſuch, that to the taſte its aſtringency is almoſt entirely concealed, and hence it may be leſs heating to the ſyſtem, and can be employed more ſucceſsfully in the earlier ſtages of fever than the common Bark, the aſtringency of which appears to be in a much greater proportion to its bitterneſs.

Another advantage of the yellow Bark, ſtill more important is, that in many fevers of the remittent kind (particularly thoſe of warm

climates) in which a ſuperabundance of bile in the primæ viæ may contract, indicate the uſe of common Bark, the yellow Bark by its ſuperior bitterneſs, ſeems to be peculiarly adapted.

The remarkable bitterneſs of yellow Bark appears in a very ſtriking manner from the experiments of Mr. Babington, who relates, that five pounds of this bark in powder ſtrongly impregnated this quality by cold infuſion to above one hundred gallons of water, and which upon evaporation yielded of extract, one fourth part of the weight of the powder, employed. The reſiduum ſtill however poſſeſſed a degree of bitterneſs and aſtringency equal to thoſe

of the common Bark; and an opportunity offered of proving that it was not inferior in point of efficacy. For having admitted into the Hoſpital, a man, who had for ſix months laboured under an intermittent, and for which he had not only taken the various forms of common Bark, but alſo arſenic; I ordered a dram of this reſiduum when dried, to be given to him every two hours, this averted the next expected paroxyſm, and by repeating the doſe at more diſtant intervals, he continued well.

My objection to the employment of bark in powder, ariſes, as before obſerved, from the quantity neceſſary to conſtitute a doſe, and from the difficulty of many ſto-

machs in retaining and digeſting ſuch large and repeated doſes as ſome intermittents require. To many alſo, any fluid form of the bark is extremely unpleaſant and nauſeating, with ſuch we are neceſſarily obliged to reſort to the extract, formed into pills. For this purpoſe, the ſpirituous extract of yellow Bark, prepared according to the proceſs related in the experiments, will be found a convenient and efficacious form, as containing all the medical powers of the bark in the moſt concentrated ſtate. According to the calculation of Mr. Babington, fifteen grains of this extract, are equal in efficacy to a dram of the powder, and my experience enables me to ſay, that

the utmoſt reliance may be placed on this preparation. Beſides, when the tone of the ſtomach is much weakened, it is probable, that this organ, though able to retain the powdered bark, may not poſſeſs ſufficient power to thoroughly digeſt and extract its virtues; therefore the extract of the bark, in which the efficient parts of the medicine are already evolved by artificial means, will not only be more eaſily digeſted, but alſo paſs more readily into the ſyſtem.

Before I conclude this Inquiry, I have to obſerve, that the ſubject of it has within the laſt ſix weeks become much more generally known, eſpecially in this metropolis; and I have lately converſed

with ſeveral medical men, who have had occaſion repeatedly to employ the yellow Peruvian Bark, all of whom have been ſo well ſatisfied with its efficacy, as to prefer it to the other Peruvian ſpecies. Theſe opinions, and the voluntary written teſtimonies here ſubjoined, which have come into my poſſeſſion ſince the commencement of this Inquiry, have, I confeſs, afforded me great ſatisfaction; and I already begin to feel additional gratification in thinking myſelf inſtrumental to much public good, by calling the attention of the faculty to this new medicine.

FINIS.

A LETTER FROM DR. WOODVILLE, PHYSICIAN TO THE SMALL-POX AND INOCULATION HOSPITALS.

DEAR SIR,

HAD *you required any ſpeculative opinion of mine, with a view to its publication, I ſhould have oppoſed it, as preſumptuous on my part, and unavailing on yours; but as you requeſt only the ſtatement of a matter of fact, concerning the effects of the yellow Bark at the Small-pox Hoſpital, I moſt willingly comply; feeling no other reſtraint than that ariſing from an extreme caution not to repreſent the efficacy of that bark in a more favourable light than all the circumſtances fully warrant.*

Though I generally deem the exhibition of the bark inadmiſſible, during the early ſtate of the variolous eruption, yet in the

latter ſtages of it, and in ſphacelous ſores, and various other affections, either accompanying the caſual ſmall-pox, or ſuperinduced by it, the Cinchona Bark is employed as the chief indicatum, inſomuch, that recourſe is had to this medicine ſooner or later, with nearly one half of the patients admitted into the Small-pox Hoſpital.

It is more than ſeven months ſince I firſt began to preſcribe the yellow inſtead of the common Bark at the Hoſpital, deſiring Mr. Wachſel the apothecary, to obſerve attentively whether its effects appeared to him more or leſs beneficial than the common bark had been in ſimilar caſes. I had ſoon the ſatisfaction to find that his obſervations coincided with mine, in determining, that in a great number of variolous caſes, of the ſimilitude of which the diſeaſe furniſhes peculiar viſible evidence, the comparative efficacy of the yellow Bark

unequivocally excelled that of the common Cinchona.

I was ſo fully convinced of the juſtneſs of this concluſion, that in April laſt it was noticed in Medical Botany, (Part II. *No.* 6.*) I muſt remark however, that reſpecting the febrifuge effects of this new bark, I have no experience; for my obſervations, which were founded on more than one hundred inſtances, relate entirely to its tonic or antiſeptic powers.*

After what has been ſaid, it is ſcarcely neceſſary to add, that I hold the yellow Bark in great eſtimation, and as it commonly agrees with the ſtomach in large doſes, and ſeems leſs liable to diſorder the bowels than

that of the other ſpecies of Cinchona, I have no doubt in giving it a decided preference.

I am, Dear Sir,

Your faithful Friend,

W. WOODVILLE.

Small-pox Hoſpital,
June 20, 1794.

A LETTER FROM DR. LIND, PHYSICIAN TO THE ROYAL HOSPITAL AT HASLAR, TO MR. BABINGTON.

DEAR SIR,

I BEG *to acquaint you that I have made trial of the yellow Bark which you ſent to me in five caſes of agues, one quartan, three tertians, and one quotidian; in two caſes of malignant fevers; in three of weakneſs of the ſtomach, one ſucceeding a fever, and two ſucceeding a dyſentry; and in ſeveral caſes of general weakneſs after fevers. In all it produced the uſual effects of common Peruvian Bark. The agues were completely cured by it. It was given in the ſame forms and doſes as com-*

mon Bark, and by its effects could not be diſtinguiſhed from it.

I am,

Dear Sir,

Your moſt obedient humble Servant,

JOHN LIND.

Royal Hoſpital at Haſler,
21ſt Nov. 1793.

THE FOLLOWING WAS RECEIVED FROM MR. JONES OF GRACECHURCH-STREET.

TO DR. RELPH.

DEAR SIR,

In compliance with your requeſt I ſend you the following remarks on the yellow Peruvian Bark, and if they ſhould prove uſeful and fall within the deſign of your intended publication, they are entirely at your diſpoſal.

In the ſpace of two years, I have uſed nearly four cheſts of this bark. I have not only diſcovered, that in all caſes it is capable of doing every thing which can be done by the beſt pale Bark, but in obſtinate caſes of intermittents, in which common Bark has failed, it has invariably cured the diſeaſe.

I have experienced no inconvenience from

its bitterneſs; it does not nauſeate the ſtomach, nor irritate the bowels; and in fevers of a typhous and continued kind, it appears to me to have a peculiar effect in cleaning the tongue, and at the ſame time promoting the neceſſary ſecretions.

If I were deſired to eſtimate its comparative effects, I ſhould affirm, that half a dram of it is equal in point of efficacy, to a whole dram of quill-Bark, *and that it has a decided advantage over red Bark, by being much more acceptable to the ſtomach. It may be preſerved in decoction for a very conſiderable time, even in hot weather, which, in my opinion, is an infallible proof of its ſuperior antiſeptic powers.*

I have the honour to be,
Dear Sir,
Your obedient and very humble Servant,
J. JONES.

Gracechurch-ſtreet,
July 10, 1794.

I WAS FAVOURED WITH THE FOLLOWING LETTER FROM MR. GAITSKELL.

TO DR. RELPH.

DEAR SIR,

As the yellow Bark has been the ſubject of your particular inquiry, and a complete inveſtigation of its powers the ſummit of your wiſhes, every elucidating fact of its medical influence may be acceptable; therefore, agreeable to your requeſt, permit me to contribute the little information a few months experience has furniſhed me.

My eſſays were made on ſpecimens preſented me by my much eſteemed friend Mr. Babington. From experiments on its ſenſible properties I had evidence of its ſuperior powers, and from its application in practice,

the fulleſt confirmation of my hopes. I wrote Mr. Babington my opinion, that after twenty five trials of this bark, it accompliſhed the cure of diſeaſes in much ſmaller doſes than uſual; a great deſideratum in medicine, as the quantities of pale Bark requiſite in obſtinate caſes of intermittents, frequently prove objections to its exhibition. After ſix months trial of this medicine, in more than four hundred different patients, I have no heſitation in aſſerting, that half a dram of yellow Bark is competent to effect more than double that quantity of pale Bark.

The moſt excruciating pains in the head of the true quotidian type, tertian and quartan intermittents, typhous remittents, leucophlegmaſia, dyſpepſia, leucorrhæa, rheumatiſmus chronicus, eryſipelas, anthrax, and variola confluens maligna, have all been ſubjected to its action, and in general with the happieſt ſucceſs. In each of theſe caſes

the article was adminiſtered in ſubſtance, excepting in dyſpepſia and leucorrhœa, which yielded more readily to the lighter preparations of it, as the infuſion or decoction.

The medicine agreed well with my patients in general, it cheered their ſpirits, improved the appetite, and reſtored the weakened energy of the ſyſtem. In two ſcruple doſes it ſometimes produced nauſea at the ſtomach, or occaſional diarrhœa, which ſuffered mitigation by laudanum, in combination with aromatics, or reducing the quantum of bark.

Its power on intermittents was ſpeedy and effectual in every inſtance but two, which reſiſted all ſorts of cortex, and ultimately yielded to arſenic. I ſhall conclude theſe remarks with mentioning, that my partner Mr. Maddox and myſelf, are ſo perfectly

ſatisfied of its pre-eminent utility, as to adopt it in practice to the total excluſion of the other barks.

I remain with the greateſt reſpect,

Yours, &c.

WILLIAM GAITSKELL.

Rotherhithe,
June 9, 1794.

EXTRACT OF A LETTER FROM MR. JENNER, AT PENSWIC, IN GLOUCESTERSHIRE, TO DR. CHESTON, OF GLOUCESTER.

June 11, 1794.

"*In answer to your inquiry, relative to the effects I have observed from the use of the yellow Bark, the following case speaks much in its favour, being indeed the only ague I have for some time had under my care.*

"*A. W. after her lying-in, laboured under a fever, attended with great weakness, and which at last terminated in a regular quotidian. I administered the red Bark in substance, but it would not stay upon her stomach. I then tried the Angustura Bark, which she kept down in sufficient quantity, but without producing the effect desired. I then gave her four doses*

of the yellow Bark, two ſcruples in each, which put a ſtop to her fit immediately; the next day ſhe repeated the powders, continued well, and has had no return ſince. This happened in February laſt. I have ſince given it in caſes of debility with very good effect, and obſerve one great advantage in uſing it, that a ſmaller quantity ſeems to produce the ſame effect as a larger one of the common Bark."

EXTRACT OF A LETTER FROM MR. HARE, AT SOUTHMINSTER, ESSEX, TO MR. BABINGTON.

November 12, 1793.

"*As you ſeemed deſirous of being informed of any further particulars reſpecting your new bark; in addition to my former account I have only to add, that I have extended the conſumption as much as poſſible, both gratuitouſly and otherwiſe, and that it has uniformly ſucceeded to my moſt ſanguine expectations. In the cure of agues, both tertians and quartans I have uſually given from eight to twelve drams during one intermiſſion, and in thoſe caſes where ſufficient time has elapſed to enable me to judge, I think the tendency to relapſes has not been ſo great, as after the exhibition of the other ſorts of bark. It has ſucceeded equally well in remittents of*

all kinds. I am now giving it for the cure of a large ulcer of a very malignant kind. I have had experience ſufficient to convince me, that it poſſeſſes all the virtues of the beſt Bark we are at preſent acquainted with."

MR. STOKER, OF TITCHFIELD, HAMPSHIRE, COMMUNICATES THE FOLLOWING TO MR. BABINGTON.

"*I* HAVE *been uſing the yellow Bark, and can ſay, it has in every inſtance produced all the effects I could have expected from the other barks. In the numerous caſes in which I have adminiſtered it, it has never diſagreed with the ſtomach. Four doſes of decoction cured an ague of ſix weeks; ſix drams of powder, another of three weeks; but when I am more at leiſure I will communicate to you more particulars reſpecting this bark, as I am at preſent engaged in examining it pharmaceutically by means of different menſtrua.*"

EXTRACT OF A LETTER FROM MR. NEWELL, AT COLCHESTER, TO DR. SAUNDERS.

April 20, 1794.

"*I* HAVE *uſed the yellow Bark in ſeveral caſes of intermittents, which are common diſeaſes with us, and with great ſucceſs. It appears to me to be much ſtronger than the pale Bark, and full as ſtrong as the red Bark. I have cured ſeveral intermittents with only three drams of it, after the uſe of an emetic; and indeed that quantity either of it or the red Bark, has been commonly found ſufficient with me to ſtop an ague fit. I can ſay nothing with regard to its chemical analyſis, but from its ſenſible properties, I think it much more bitter than the common Bark.*"

A LETTER FROM MICHAEL O'RYAN, M. D. LATE PROFESSOR OF THE PRACTICE OF MEDICINE IN THE COLLEGE OF LYONS IN FRANCE, AND FIRST PHYSICIAN TO THE GRAND HOTEL DIEU OF THAT CITY.

TO DR. RELPH.

London, July 11, 1794.

SIR,

THOUGH the observations contained in this letter may, after what you have written on the subject of Yellow Bark, be found, in a great measure, unneceſſary, they will at leaſt ſerve to ſhew, that whatever may now be aſſerted in favor of this important remedy, cannot ſurpaſs what the faireſt trials, given it on the Continent for theſe ſeven years paſt, have eſtabliſhed in the moſt inconteſtible manner.

The Yellow Bark was preſented to the Council of Adminiſtrators of the Hoſpital, or GRAND HOTEL DIEU *of* LYONS, *in the beginning of the month of November*, 1786, *by the houſe of Meſſ. Rey & Co. who had juſt received a very large quantity of it from their friends at Cadiz. The hiſtory given of it by theſe gentlemen was, that the Peruvian Mountaineers having made an irruption into the Spaniſh poſſeſſions, and having been not only repulſed but purſued very far into the mountains; the army, on its return, diſcovered many trees which furniſh this Bark, much more lofty and large than thoſe which grew on the lower grounds; the ſoldiers ſtript them, and each brought home a load of the Bark, which being bought up by the Spaniſh merchants eſtabliſhed at Peru, was ſent to Cadiz. It was further added, that ſeveral perſons to whom this Bark had been adminiſtered by the phyſicians of Cadiz, received the greateſt benefit from it.*

The Hoſpital of Lyons had an exclusive privilege from the Kings of France, exempting it from paying duties on any article imported for its uſe:

this enabled the adminiſtrators to keep the moſt complete pharmaceutical collection in Europe: it was the Hall which ſupplied not only all the apothecaries ſhops in Lyons, but thoſe alſo in all the ſurrounding towns; for the druggiſts and apothecaries found it much cheaper and leſs troubleſome to deal with the adminiſtrators, than to import their drugs, and prepare them themſelves. The profits which accrued to the houſe from this branch of trade alone, amounted to an hundred pounds ſterling a week, excluſive of all kinds of remedies furniſhed to the patients, the number of whom exceeded very often twenty thouſand yearly. The ſtores, particularly of ſimples, were immenſe; that of choice Bark was very conſiderable, its prime coſt amounted nearly to a thouſand pounds; of courſe, had the Yellow Bark been found by experience and obſervation to ſurpaſs it, the loſs ſuſtained by the Hotel Dieu *muſt have been very conſiderable.*

I hope, Sir, you will excuſe this digreſſion, which I thought neceſſary in order to ſhew, that if the Yellow Bark came into ſuch repute as to be almoſt the only ſpecies of this valuable remedy

employed in Paris, and all the other cities in the kingdom, in the ſpace of a few months after it was examined by the phyſicians of the Hoſpital of Lyons; it is to its own ſuperior merit it owes this preference, and not to any of thoſe mean mercenary views and practices to which ſo many other remedies are indebted for their ſhort-lived celebrity; a circumſtance which, in my opinion, is no ſmall commendation of it.

By a law of the hoſpital, a General Council was directed to be held on the firſt day of each month, to enquire into the ſtate of the houſe; it was compoſed of the thirteen adminiſtrators, the four phyſicians, the firſt ſurgeon, and the firſt apothecary. Every reform or improvement that was propoſed by any of the members was debated, and then accepted or rejected by a plurality.— Although the time of the meeting of this aſſembly was not far diſtant, the adminiſtrators, actuated by the laudable deſire of converting, without the leaſt delay, this remedy to the uſe of our patients, if it anſwered the encomiums made of it, invited their phyſicians to meet and examine imme-

diately the Yellow Bark, in order to be able to deliver their opinion of it at the enſuing general aſſembly.

The ſamples that were laid before us conſiſted of large pieces, ſome covered with the outer thin ſkin, others entirely ſtript of it, and quills: the former clearly belonged to the trunk of the tree; the latter to the ſmaller branches: the colour of the large pieces, as alſo of the quills when broken or opened by a ſhort maceration in water, was yellow, ſlightly inclining to red.—We all agreed, that it was bitterer than any other known Peruvian Bark, but more aromatic, conſequently leſs nauſeous. When expoſed to the ſun, we obſerved that its inner ſurface particularly exhibited an infinite number of ſparkling points, which denote an abundance of reſin—boiled for ten minutes over a briſk fire in the Rhone water, (which we knew by our experiments on the waters of Lyons to be the pureſt) in the proportion of half an ounce to a pint, the decoction was of a fine yellow colour, ſlightly inclining to red, bitter and aromatic to the taſte. Upon examining the reſiduum we found it

ſtill heavy, its texture not much impaired by boiling, and when chewed, bitter and aromatic. Concluding from this, either that it had not boiled long enough, or that the quantity of water was not ſufficient to extract its contents, we ordered it to be boiled in the ſame decoction for ten minutes longer; but this not appearing to us much ſtronger than the former, and perceiving that the weight, texture, and other qualities of the bark were not ſenſibly diminiſhed, we had it boiled for a quarter of an hour in half a pint of freſh water, and found that this ſecond decoction was very near as ſtrong as the former. The liquor, laid by in bottles, did not depoſit, after ſtanding two days, any thing like the quantity of ſediment as that of the common bark.

We then proceeded to inquire into the quantity of extract contained in the Yellow Bark; and in order to eſtabliſh their comparative merits, we alſo ordered ſeparate extracts to be made at the ſame time, from a like quantity of common Bark of an inferior kind, which had been laid by for external uſe, and enemas, *and from our ſelected red*

Bark. The quantity of an agreeable bitter and aromatic extract obtained from the Yellow Bark was three times that yielded by our common bark, and just double the quantity which our selected red Bark afforded. These experiments, repeated several times before the meeting of the General Council, having invariably afforded the same results, we delivered a report on the first of December; the substance of which was, that both from its sensible properties, and our pharmaceutical observations, the Yellow Bark appeared to us far superior to any species of other bark with which we were hitherto acquainted. But as it sometimes happens, that medicines do not answer in practice the expectations raised by their analysis, we recommended that only such a quantity of this remedy should be purchased as was necessary to give it a trial on our patients, the considerable number of whom would soon enable us to give a decided opinion respecting its qualities.

The City of Lyons is circumscribed on all sides by lofty mountains; two great rivers, the Rhone

and Saone, running on the north-eaſt and ſouth-weſt ſides of it, keep up a conſtant filtration through the gravelly ſoil on which it is built; theſe circumſtances, joined to other cauſes, ſubject its inhabitants, particularly the poorer ſort, who moſtly live in vaults and other damp places, to all thoſe diſorders which are moſt prevalent in marſhy or moiſt ſoils. Thus the intermittent and remittent fevers, the dyſentry, &c. are endemical in this city.

The intermittent fevers generally manifeſt themſelves in the beginning of the month of September, and ceaſe towards the end of November; ſome of them however run on to the following ſpring, changing their type ſeveral times during the winter. The remitting fever is moſtly of the ſlow nervous, or of the putrid kind. The nervous ſets in in the months of April and May, and diſappears when the violent heats of June and July begin; it returns again in the months of October and November, and if the enſuing winter happens to be moiſt and warm, as is frequently the caſe in that climate, it does not

ceaſe entirely until about the middle of May; a ſmart froſt however, or a conſiderable fall of ſnow, which ſometimes happen in the months of December or January, never fail to check its progreſs, or even put an entire ſtop to it during that ſeaſon.

The putrid remittents make their appearance towards the middle of June; when the heat is very intenſe, and not tempered by frequent ſhowers of rain, its effects are very pernicious: the diſorder becomes more epidemical, but leſs dangerous in proportion to the moiſture of the ſummer; when this is copious, though they continue until the middle of October, ſtill the exacerbations are not attended with any alarming ſymptoms. Thoſe that are not cured at this period, degenerate into autumnal intermittents, many of them continue through the winter, until the firſt months of the following ſpring.

The winter at Lyons in 1786, *was remarkably wet and warm, as was alſo the ſpring of* 1787, *ſo that not only the recovery of patients*

attacked in the hot months and autumn, with the foregoing fevers and dyſentry, was very ſlow, but alſo there appeared but very little abatement in the intenſeneſs of the ſlow and nervous fever, and an unuſual number of putrid ones were obſerved to break out even in the midſt of this ſeaſon.

Were we to have no further proofs of the virtue of Yellow Bark, than thoſe with which it furniſhed us from the middle of November until the beginning of April, theſe alone would be ſufficient to eſtabliſh its very great ſuperiority over every ſpecies of this remedy hitherto known. As Phyſicians advance in years and practice, enthuſiaſm in favour of any remedy whatſoever gradually wears off; their ardent hopes of ſucceſs from remedies extolled as ſpecifics, even by authors of the firſt note, have been ſo often baffled, that a ſalutary pirrhoniſme at laſt takes place, which prevents their laviſhing encomiums on any of them, which are not founded on undoubted facts. On theſe grounds I can ſafely aſſert, that out of many hundreds of caſes, wherein this bark

was adminiſtered in our Hoſpital, I do not recollect even one in which it failed of ſucceſs: nor was it neceſſary to uſe ſuch large quantities of this ſpecies of Chincona as of the others in order to produce the deſired effect: experience ſoon taught us not only that three drams of Yellow Bark were equal in virtue to an ounce of our other beſt bark, but alſo that when once the return of the paroxyſm was prevented by its uſe, (and even in many extraordinary caſes one ounce was equal to the taſk) it was needleſs to employ it any longer as a febrifuge; the fever was cured, and nothing more than a proper regimen was requiſite to reſtore the patient to perfect health.

Several members of the College of Phyſicians, who were invited by us to the general aſſembly of December, and had examined the ſamples of the extract which we produced, having made much uſe of the Yellow Bark during the winter in their private practice, and attended to our viſits in the hoſpital, now not only extolled it in private, but alſo two of them publiſhed works filled with its praiſes: the Phyſicians of the Hotel Dieu how-

ever deferred giving their final approbation, until they ſhould have an opportunity of employing it in the putrid remittent fever of the ſummer, in which they could obtain an unequivocal teſt of its virtues. But as the encomiums given it in the publications juſt mentioned, began to make the public acquainted with its excellent qualities, and that conſequently its price was daily augmenting, they recommended to the adminiſtrators to buy up, without loſs of time, a very large quantity of it, leſt the poor of the Hoſpital ſhould be ſtinted by its becoming dear.

During the months of April and May, 1787, the Yellow Bark was employed but very ſeldom in the Hotel Dieu; a fever of the catarrhous kind, but benignant, reigned very generally at that period; and though it aſſumed in many caſes the type of a double tertian, ſtill we preferred letting it take its courſe, and dwindle away, which it ſeldom failed to do, by gentle ſweats, and an expectoration of a mucous nature, in the ſpace of ſeven or nine days, rather than ſtop it with the bark, as we had many inſtances on former

occaſions of conſumptions and other diſorders of the breaſt being brought on by this latter practice.

Early in June this fever began to aſſume a moſt ſerious aſpect; it ſtill as at its commencement retained its double tertian type; but after the fourth day from its invaſion it generally became continual; the ſigns of putrefaction were evident not only from the offenſiveneſs of the ſtools, but alſo from the ſcent of the ſweat and breath; each exacerbation *was attended with violent and fruitleſs efforts to vomit, which were ſucceeded by ſo great a proſtration of ſtrength, that the worthy lay-nuns who attended the ſick, often thought the patient was really dead. Many were covered with dark and livid ſpots, or petechiæ; and indeed in ſo diſſolved a ſtate did the blood appear, that the ſputum was very generally tinged with it.*

As the Hoſpital of Lyons is one of the beſt aired and cleaneſt in Europe, and that the patients, ſo far from being crowded, were laid in ſeparate good beds, placed at the diſtance of three feet one from the other, we were for many days

at a loſs to account for the cauſe of ſo malignant a diſorder; and it muſt be owned, that before we recovered from our ſurpriſe and doubts, many were loſt, who, as we had ſtrong reaſons to believe afterwards, might have been ſaved, had we not from experience, dreaded the effects of the Bark, in the ſpring catarrhous fevers of that climate.

Soon perceiving, however, that moſt of the ſick, who were brought in great numbers, were either priſoners, or perſons who dwelt very near the two goals, St. Joſeph, *and* La Quarantaine, *ſix Commiſſaries, four of whom were the Hoſpital Phyſicians, were immediately appointed by the College, to examine into the ſtate of thoſe places, and the adjoining houſes. The reſult of this inquiry was, that the Intendant of Lyons having given orders to arreſt the beggars and vagabonds that could be found in the city, and on the roads about it; but not having the foreſight to appoint ſome proper place in which to confine them, crowds were thrown into theſe priſons, already too full; and when the intenſeneſs of the heat was conſidered,*

as alſo the walls which cloſely ſurrounded thoſe houſes, by their extraordinary height, prevented a free ingreſs and circulation of air; that the windows of theſe jails were very few, and very ſmall; that the ſtraw on which thoſe miſerable creatures lay was half rotten; it was evident that the fever with which three-fourths of the priſoners were then attacked, was the jail diſtemper; that the diſorder had already ſpread itſelf among the neighbours, and cauſed a great mortality.

In conſequence of this information the utmoſt diligence was employed, in opening freſh wards in the Hoſpital, wherein not only the patients who had any ſymptom of this contagion were immediately depoſited, but alſo for the reception of all thoſe who ſhould be brought in from the priſons and their neighbourhoods. *A proviſion of the Yellow Bark was ſent into the jails, and* a reaſonable quantity *of it was diſtributed to the families who, by their proximity were moſt expoſed to infection, with ſhort printed inſtructions for employing it. The Phyſicians of the Hotel*

Dieu, who gave theſe directions, adviſed, that each priſoner though not in the fever, ſhould take as a preſervative, a dram of this remedy, boiled in half a pint of water every day; and that thoſe who actually laboured under it, ſhould begin immediately after the paroxyſm, to take four ounces of a decoction of the Yellow Bark, made in the proportion of half an ounce to a quart of water, every two hours, and continue its uſe, even in the future fits, until the patient ſhould have taken of ſix quarts.

I have already treſpaſſed too much on the limits of a letter, to attempt deſcribing the many extraordinary caſes in which the Cinchona flava gave conſtant proofs of its cexcellence during the reign of this epidemic diſtemper. Let it ſuffice then at preſent to declare, that on this moſt emergent occaſion, as well as on every foregoing and ſubſequent one, it never once failed to anſwer our moſt ſanguine expectations.

Our final opinion therefore, given at the General Aſſembly, on the firſt of October, 1787, was highly in its favour, and from that period

until the middle of September, 1792, when I fortunately made my escape out of that guilty and distracted kingdom; *its reputation rose to such a pitch that though its price became enormous, (selling there at the rate of three shillings and sixpence an ounce) it was the only species of Cinchona employed, particularly in any disorder which appeared in the least dangerous, and therefore required a certain and speedy remedy.*

I own, Sir, that on my arrival in England, I was equally surprised and concerned to find that this valuable remedy was unknown here except to a few empirics, who, according to the custom of this set of men, were vending it very dear, under feigned names, as a secret for the cure of fevers;—your learned work however will soon rescue it out of their hands, and from obscurity; *and to you only will be due the praise of making your country acquainted with a remedy, the useful qualities of which every physician will allow when once he has given it a fair trial.*

I am, Sir, &c.

MICHAEL o'RYAN.

My Dear aunt I have the
opportunity to write these
few lines to you I hope you are
all quite well

Elizabeth Mulbee

My Dear Sister Amelia

I hope you are quite well