Mrs Holms

Geo. Miller
of FRANKFIELD

AGRICULTURE,

THE

PRIMARY INTEREST

OF

GREAT BRITAIN.

BY

DAVID YOUNG,

AUTHOR OF

NATIONAL IMPROVEMENTS.

Oh! is there not ſome Patriot, in whoſe pow'r
That beſt, that godlike luxury is plac'd,
Of bleſſing thouſands, thouſands yet unborn,
Through late poſterity? Some, large of ſoul!
To chear dejected Induſtry! To give
A double harveſt to the pining ſwain?
And teach the lab'ring hind the ſweets of toil?

THOMSON.

EDINBURGH:

PRINTED BY D. PATERSON,

FOR THE AUTHOR; AND SOLD BY C. ELLIOT, EDINBURGH;

AND C. ELLIOT AND T. KAY, LONDON,

AND OTHER BOOKSELLERS.

MDCCLXXXVIII.

☞ Commiſſions may be addreſſed to D. YOUNG, *Perth.*

TO THE

RIGHT HONOURABLE WILLIAM PITT,

FIRST LORD COMMISSIONER OF THE TREASURY, &c. &c.

SIR,

THE truly patriotic character which you have uniformly ſupported, renders it unneceſſary for me to apologize, for preſuming, without permiſſion, to offer to your conſideration, a ſubject of the utmoſt national importance.

That the ſtrength of a nation conſiſts in the number of the people, is an axiom in politics; and that the populouſneſs of any country can only be in proportion to the means of ſubſiſtence, is a ſelf-evident truth. And hence it follows, as an undeniable conſequence, that Agriculture is the principal ſource of national affluence and power.

If then a plan can be deviſed by which the produce of Britain may be increaſed in a ten-

fold

fold *ratio*, it is ſufficiently obvious, that the riches and ſtrength of the kingdom will be equally increaſed. Such a plan I have the honour to propoſe to you in the following treatiſe. And permit me to aſſure you, that it is not the fruit of cloſet ſpeculation, but the offſpring of real practice, and long experience.

The preſent period is peculiarly favourable to the moſt enlarged ſchemes of national improvements. Providence has favoured us with univerſal peace. By the wiſdom of his Majeſty's councils we are bleſſed with an unanimity to which we have long been ſtrangers; and a liberal and enlightened ſpirit is diffuſed through the nation.

At ſuch a period, may it not be expected, that you will turn your thoughts to the too much neglected ſcience of agriculture. If a well-digeſted plan were authoriſed by the legiſlature, compelling the cultivation of waſte lands, and encouraging a rational ſyſtem of huſbandry throughout the iſland, its ſucceſs would probably anſwer the moſt ſanguine expectationsthat could be formed.

The name of PITT was once rendered illuſtrious, by directing the thunders of Britain

tain in every quarter of the globe, and humbling her proudeſt enemies. But if to give bread to millions, and ſow the ſeeds of plenty for future generations, is more laudable than the deſtruction of our enemies, that name may ſtill riſe higher in glory, if you become the patron of agriculture.

Allow me to add, that if the enormous load of national debt with which we are burdened, is to receive any conſiderable reduction, the principal ſource from which the funds muſt be drawn, is not the riches of Hindoſtan, nor even manufactures and commerce at large, but the arable fields of Britain.

Should any thing ſuggeſted in this publication afford the ſmalleſt aſſiſtance towards the effecting theſe important purpoſes, it will fully ſatisfy the ambition of,

SIR,

Your moſt obedient,

and very humble ſervant,

EDINBURGH,
May 22. 1788.

DAVID YOUNG.

PREFACE.

THE favourable reception with which a former publication was honoured by the moſt eminent practitioners of agriculture, has encouraged the author to uſher this ſecond treatiſe into the world.

It did not appear to him ſufficient, merely to point out the methods moſt proper to be followed by thoſe who were actually engaged in the practice of agriculture. Something ſeemed neceſſary to be done in order to awaken the attention of thoſe who have it in their power to promote the improvement of this moſt uſeful art, by giving advantages to the farmers which they do not at preſent poſſeſs; and without which it can ſcarce be expected, that great progreſs can be made. It is neceſſary alſo, to call off the attention of individuals of all ranks from ſpeculations of a different kind, in which too many are now engaged, frequently to their own detriment, as well as to the manifeſt hurt of the community.

For

For this purpoſe, he has preſumed to offer his opinion to thoſe who are entruſted with the management of public affairs; and has endeavoured to demonſtrate, that no method of raiſing the wealth and power of any nation can be compared with that of encouraging agriculture. He has ſhewed, in the moſt clear and demonſtrative manner, that this muſt far exceed every ſcheme merely commercial, whether foreign or domeſtic; nay, that the only true way of encouraging manufactures and commerce, is by giving encouragement to agriculture as their foundation. He has taken the liberty to point out ſeveral methods by which agriculture might, with very little expence, receive ſuch encouragement from government, as would not only amply repay the ſum laid out at firſt, but bring in an immenſe revenue, impoſſible to be raiſed in any other way. Many of his plans are original, and the ſubjects handled in a manner entirely new; though the Author can certainly declare, that they are not the reſults of mere theory, but moſt of them confirmed by his own obſervations, and the experience of many years.

To landholders in general he has pointed out

out the methods of managing their eſtates in ſuch a manner as to enſure wealth to themſelves, and happineſs to their tenants; and to the latter he has alſo ſhewn how they may always keep their farms in good condition; and thus live comfortably without embarraſſment or difficulty in paying their rent. And laſtly, from many convincing arguments, it is ſhewn, that the produce of Britain might in leſs than half a century be augmented to ten times its preſent value.

The work is interſperſed with many curſory remarks relating to the conſtruction of villages, for the encouragement of fiſheries as well as of agriculture; the whole deſigned to ſhew how the population, and conſequently the ſtrength of the kingdom may be augmented to an amazing degree; how the great may increaſe their wealth, and the poor may be made happy: Every thing being illuſtrated from obſervations made in different parts of the country, and thus adapted to every poſſible variety of local ſituation.

The ſubjoined atteſtation of a number of eminent farmers, ſeveral of whom have acquired conſiderable fortunes, by purſuing a mode of cultivation ſimilar to that recommended

mended in theſe Eſſays, fully evidences, that it would be highly advantageous to Britain, if it was univerſally adopted. But whether the plan propoſed by the Author is adequate to the end or not, the ſubject merits the conſideration of the legiſlature.

If what he has propoſed ſhall appear to be founded on facts, it certainly ought to obtain every public encouragement: Or, if it ſhould meet with diſapprobation, ſome other method, to effect the ſame great purpoſe, ſhould ſurely be adopted. For, it is certain, that no ſcheme equally permanent can be deviſed to increaſe the riches and population of the nation, as giving proper encouragement to improvements in agriculture.

RECOMMENDATION.

WE have read, with great ſatisfaction, Twenty-ſeven ESSAYS ON NATIONAL IMPROVEMENTS UPON AGRICULTURE, BY DAVID YOUNG, IN PERTH.

We cannot help thinking we only do Mr YOUNG juſtice by teſtifying our approbation of theſe Eſſays. They are, in general, plain, practical, and ſuited to the capacities of the Farmers, who ought to read and practiſe them, and extremely uſeful for the improvement of the nation in general, and of many farms in particular.

The author's chief deſign is to ſhew, were the methods he recommends adopted, that two thirds of the average ſeed ſown in Scotland may be ſaved; and alſo, that the lands in Britain, particularly in Scotland, might be made productive of ten times the quantity of corn and graſs, forty years hence, that they produce at preſent.

We are convinced of the practicability and propriety of the methods pointed out by Mr

YOUNG

YOUNG, to accompliſh theſe two important deſigns; and that, were they carried into practice, we may ſafely venture to aſſert, the advantages ariſing from them would exceed his calculation.

It is with the greateſt pleaſure, therefore, we join in teſtifying, in the warmeſt manner, our inclination to adopt the methods, and promote the important purpoſes held forth by the Author in theſe practical Eſſays.

Signed by, George Ord, *Brownfield.*
William Watſon, *Abbots Inch.*
John Cuming, *Inchinnan.*
James Richardſon, of *Catochill.*
James Matthew, *Claſhbenny.*
George Matthew, *Daleally.*
Andrew Morton, *Innernytie.*
Patrick Matthew, *Sheriffitown.*
Patrick Matthew, *Newbigging.*
John Whyte, *Kirktown.*
Dewer Lauder, *Pitfour.*
David Buchan, *Muirhead Gaſk.*
James Hunter, of *Sea-Side.*
David M'Cale, *Gorthy.*
William Blair, Jun. *Scone.*
Patrick Hill, *Inchmichael.*

The

The three firſt ſubſcribers live in the neighbourhood of Glaſgow, the others in the Carſe of Gowrie, and the neighbourhood of Perth.

The above atteſtation proves, that the produce of Britain might be increaſed to ten times what it is at preſent; which, if done, the produce would amount to at leaſt a thouſand millions ſterling annually; as it is generally admitted to be above one hundred millions at preſent.

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PLAN

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SECTION I.

INTRODUCTION.

IN a country ſo much famed for its improvements in the various branches of ſcience, and where agriculture in particular has by no means been neglected, it may ſeem ſurpriſing, that no regular or uniform ſyſtem has yet been adopted. For my own part, after more than thirty years experience and ſtudy, not only by reading, but by the moſt diligent practical obſervations I have been able to make in many places of Britain, I muſt own, that I am every day more and more confirmed in what I have already laid before the public on that ſubject; not only from the obſervations which I ſtill make, when occaſionally paſſing through the country, but by converſation with the moſt intelligent practical farmers, who, in the general, from their own experience, agree with what has been ſaid; as well as from a conſideration of the great improvements which might ſtill be

made. The more I conſider the ſubject, the more my ideas are enlarged, and the more I am ſurpriſed at perceiving the extreme difference in the management of farms juſt now prevalent in the country.

Were the preſent modes of agriculture to undergo a rigorous ſcrutiny, I believe it would be found, that not one hundredth part of the farmers manage their grounds properly, and that nine-tenths are actually undoing the improvements that have been already made. Nay, what is ſtill more ſurpriſing, it is too probable, that the very perſons who have formerly made great improvements, will often be found undoing them, to the great detriment not only of themſelves, but of the nation in general.

It is eaſy to ſee, that ſuch abſurd and contradictory conduct proceeds from the want of ſome proper and approved ſyſtem of agriculture generally known and eſtabliſhed throughout the nation: And nothing can prove the neceſſity for the eſtabliſhment of ſuch a ſyſtem, more than the conſiderations abovementioned; nor can any thing be more ſimple, or more eaſily comprehended, than the outlines of the ſyſtem I would propoſe, as the whole

whole consists only in keeping a certain portion of every farm in grass, another in corns, and another in fallow.

By pursuing this scheme, when once the proportions are universally laid down and determined, we could always ensure plenty of corn and grass, in ordinary seasons; as indeed there are few but what would be fit either for the one or the other; and those very dry seasons, which are bad for both would be best for fallow. The wet seasons are best for grass.

The many different schemes from time to time introduced into the agriculture of Britain, under the name of *improvements*, afford another, and a very striking proof, that this art is not properly understood among us at present. Whenever a science is brought to any degree of perfection, the methods of working are pretty generally the same.

The Jews were, by divine wisdom all tied down to one general rule with regard to their lands, and that without the smallest exception; namely, to allow the soil to rest every seventh year without being sown. Their obedience to the divine command was rewarded by such plenty during the other six years, that

that an incredible number of inhabitants were ſupported within the narrow boundaries of their kingdom, beſides the exportation of great quantities of wheat, &c. Now, as the divine wiſdom thought proper to impoſe a certain and uniform method of agriculture on that nation, and the good effects of their adherence to it were manifeſted by the immenſe crops produced, it certainly cannot be thought an injudicious propoſal, that an uniform ſyſtem of agriculture ſhould likewiſe be inſtituted throughout Britain. Nay, I will venture to affirm, that it is owing to the want of this uniformity that the produce is ſo ſmall; and that, inſtead of hurting the landlord, the farmer, or the nation in general, an uniformity in the plan of agriculture would be highly advantageous to them all.

Let us ſuppoſe, that one half of every farm were laid out in graſs. All ſoils would be the better for having a part in paſture, ſtrong clay not excepted: For long experience has now diſcovered, that even in the moſt improved counties in Britain, the ſoil is exhauſted when continued long with corns, even with clover and turnip; and, of courſe, the corn crops muſt every year be upon the

decline,

decline, wherever this pernicious practice is followed. For even where the farmer has a great command of dung, the ſoil is liable to be tired or exhauſted, when not allowed to reſt by fallow and paſture. We ſhall allow, as ſome pretend to ſay, that there are parts of the country leſs fit for paſture, or, in other words, leſs profitable when applied to this purpoſe, (although that very ſoil would be the better improved by paſture); but it is very certain, that nine-tenths of the ſoil in Britain is of a different nature, and would be enriched by theſe means.

By this practice, indeed, ſome individuals might think themſelves injured, but private intereſt ought, at any rate, to give way to the public good; and it might be demonſtrated that, upon a fair trial, the farmers would find themſelves, as well as the nation at large, ultimately benefited by a practice of this kind. In ſome caſes it might not bring ſo great immediate profits, but it would always certainly prevent them from ruining the ſoil, as well as themſelves, which they often do by over-cropping. Binding down the farmer, therefore, not to hurt himſelf, and not to exhauſt the ſoil, would be of very

conſiderable

conſiderable advantage to the nation; but, if this method ſhould ſtill be thought detrimental, he might be indulged with following his own plans, for the trifling expence of ſixpence to government for every acre laid out in a manner different from that of the eſtabliſhed ſyſtem. Perhaps ſome might think it would be a better plan to aſſeſs all the farms in the country at two-pence halfpenny an acre, for the purpoſe juſt now mentioned. This is no more than a voluntary contribution, only the ſanction of parliament would be neceſſary to make every one equal.

It might indeed be worth the conſideration of government, how far it would be proper to impoſe a tax upon thoſe farmers who found it for their intereſt to differ from the national plan. Each perſon might be aſſeſſed in ſo much for every acre kept in corns and graſs above the eſtabliſhed proportion, and ſo much for each acre of waſte ground that was neither improved nor planted. The taxes raiſed from theſe would be very properly employed in premiums to ſuch farmers as raiſed the greateſt quantities of corn and graſs, in following the rotation of crops fixed upon by government for a national improvement; nor would

would the farmers have any occaſion to grudge this tax, as they would have it in their power to be free when they pleaſed; and the ſums raiſed in this way might be given to ſuch of their brother farmers, as, in every county or ſhire, received, we ſhall ſuppoſe *L.* 50, for ten acres of the beſt crop of wheat the firſt year, and ſo on every year, for the different crops mentioned in the plan fixed upon by government; ſo that the farmers who were not concerned in the national plan would reap great benefit, much more than the amount of the taxes they paid. Thus alſo, the general improvement of land would ſpread very rapidly throughout the kingdom; for, by a comparative view of the produce of each acre in the different ſhires, when cultivated according to the government plan, farmers would ſoon ſee it their intereſt to adopt the ſame method, thus gaining experience from the experiments of others.

Another great advantage would ariſe from this annual regiſter, namely, that the time of ſowing would be ſpecified, and it would ſoon be ſeen, that it was greatly for the emolument of the farmers to ſow their grain earlier than they do at preſent; as the early ſowing

does

does not run ſuch riſks as the late does of being ſhaken and broken by the equinoctial ſtorms, and deſtroyed by the early froſts, which prevent the late ſown from coming to maturity; witneſs the harveſt 1787.

Were government to adopt ſuch a plan, a very large ſum would ſoon be raiſed, by which a great number of farmers of the firſt rank might be induced to follow the ſame method. The conſequence of this would ſoon be the raiſing ſuch quantities of corn and graſs, that the price of proviſions would be greatly reduced, at the ſame time that trade and manufactures would be encreaſed proportionably, beſides the annual exportation of great quantities of corn.

It is owing to ignorance or inattention to theſe things, that ſo few people underſtand what is the primary intereſt of Great Britain. The greateſt part of mankind, indeed, are led by what they ſuppoſe to be their intereſt, or what has an apparent tendency to promote it; and upon this principle they determine what ought to be the great object of the nation. Thus, the merchant declares in favour of trade, the manufacturer in favour of buſineſs, the farmer for agriculture, and ſo on in every other

branch. Unhappily, however, the generality of mankind are ſo ſelfiſh, that if they can get their own ends ſerved, they care not; though, by ſo doing, they injure their neighbours, as well as the nation at large; nay, though they ſhould even, to ſerve a preſent turn, moſt materially injure their own intereſt in time to come. How often do we ſee children, even thoſe endowed with the greateſt natural parts, ſo much addicted to play, as for its ſake, not only to neglect their education, but even ſometimes ſcarce allow themſelves the time neceſſary for food or reſt: And how often do we ſee great numbers of people, more inexcuſable than thoſe children, whoſe ſituation in life might otherwiſe entitle them to ſome degree of ſplendor, yet ſuffering their minds to be ſo engroſſed by childiſh, if not worſe diverſions and entertainments, that they will not even take time to look into their own affairs, much leſs to conſider the general intereſt of the country where they live, or of the nation at large. When ſuch cuſtoms become univerſally prevalent, it is certain that the nation is running headlong to its deſtruction, and not far from it, as is evidently

ſeen from hiſtory, in the ruin of the Roman as well as of other empires.

In order to prove whether agriculture, or trade and commerce be moſt for the advantage of Britain, firſt, Let us enquire what may be the value of all the trade in England, in its moſt extended ſtate, and how much it may be increaſed above what it is at preſent.

From the moſt authentic account lately publiſhed by the ingenious Mr William Playfair, in his Political Atlas, the whole value of the trade of England, for all the goods exported to every part of the globe, and all the goods imported from thoſe places, does not amount, in the beſt year, to above thirty millions ſterling for both. Now, it may be ſaid, trade is as much extended as it can well be; indeed, many articles are extended beyond what they can continue at: But ſuppoſing, for argument's ſake, that it was poſſible to extend the trade to double of what it is at preſent, ſay to ſixty millions ſterling, in the firſt place, it is very doubtful if this could be done, as the average of twelve years export and import is only *L.* 25,500,000. This calculation, being from 1771 to 1782, is the higheſt average of

ſeventy

ſeventy years back. Again, if it be conſidered what is the preſent produce of all the lands in Britain; ſome ſay one hundred millions, others aſſert two hundred; but, to ſpeak with certainty, ſay only one hundred millions ſterling, it is proved from the Practical Farmers recommendation annexed, and likewiſe from what is ſaid in the work itſelf, that, if the methods pointed out were reduced to practice, the produce would be ten times what it is at preſent, in the courſe of forty years, which would be a thouſand millions of additional produce at leaſt; and, if the plan propoſed were perſevered in, it would be every year increaſing, ſo long as any land remained capable of improvement.

The peculiar excellency of this plan is, that it would neither hurt trade, nor manufactures, but would tend to increaſe both very much; whereas, puſhing trade and manufactures above what they can continue at, hurts agriculture, by taking away both men and money. The only ſure method is, let agriculture and trade keep at an equal pace, the one not going before the other, as they are mutual helps to one another.

Many perſons, upon the firſt hearing of the

the amazing increaſe that might be made upon the produce of Britain, in the courſe of forty years, that is ten times the preſent produce, which would be a thouſand millions, provided the methods recommended were adopted, are filled with ſurpriſe, and cannot be brought to conceive how it is poſſible to accompliſh it in ſuch a ſhort time.

The greateſt, if not the only objection, is to get the whole nation to adopt the plans mentioned. If once the prejudice were removed, and the farmers in general only conſidered their own intereſt, and agreed to make a trial of it, the end would be gained; but, let a plan be ever ſo good, if the gentlemen and farmers are determined not to alter their old ſchemes, although bad for themſelves and the country, the end propoſed cannot be gained.

If the plan propoſed were reduced to practice, the whole land of Britain in tillage at preſent, in the courſe of ten years, would be improved, and the half of the whole would be in ſown graſs; the farmer, having ſuch a great quantity of graſs, could every year ſummer-fallow ſo much out-field, or waſte ground now in paſture, as would be equal to

a

a tenth part of his improved farm. Now, let every farmer in Britain begin to follow a regular courſe of cropping his farm, by dividing it into ten incloſures, having the one half of graſs, as is mentioned in National Improvements, beginning to ſummer-fallow a tenth part of the beſt of his farm every year. In ten years he improves the whole he has in tillage at preſent, and the half in graſs: Whenever that is done, he begins to ſummer-fallow as much every year as he can eaſily overtake, which may be at leaſt a tenth part, new brought in from waſte ground, or paſture to his farm; which would be every year improving not only as to quantity, but in quality. So that, agreeable to this plan, every farmer in Britain, from the leaſt to the greateſt, might begin and improve the beſt ſoil of his farm, the firſt ten years, which will do more than pay him the whole expence in that time, and afterwards he might go on in a ſimilar manner, improving every year, as long as he has paſture and waſte ground to bring in. So that, if this plan were univerſally adopted, the average produce would be more than ten times the preſent, in the courſe

of

of forty years. It is not meant by this, that every farm that is improved at preſent would produce ten times its quantity; but, one farm, taken with another, good and bad together. This will not be at all ſurpriſing, if it be conſidered, how much the produce would be increaſed by improving the land that is juſt now in tillage, in paſtures, and waſte ground.

SECTION

SECTION II.

The comparative advantages of agriculture to trade and commerce, exemplified from the history of various nations, in different ages of the world.

THOUGH, from ſome accidental cauſes, it has been, for a long time paſt, the uſual practice of the inhabitants of this country, to view, in their utmoſt magnitude, the advantages ariſing from trade and commerce, as well as the diſadvantages and inconveniencies ariſing from attempts towards the improvement of agriculture; yet, I am perſuaded, that every perſon, who gives himſelf the trouble of ſeriouſly conſidering what has been delivered in the foregoing pages, will find himſelf already convinced, that to improve agriculture muſt be the primary intereſt, not only of this, but of almoſt every other nation in the world.

That

That commerce and manufactures are the moſt effectual, if not the only means, by which any nation can be enriched, or rendered potent and flouriſhing, has been ſuppoſed an undoubted truth; and, in ſupport of this, the examples of antient Tyre, Carthage, the Venetians, Dutch, and Britiſh are adduced.

Indeed, if by riches and power, we mean the poſſeſſion of money, or having among us a vaſt quantity of it in circulation, the maxim, in ſome reſpects, may be allowed to hold good; but, if to theſe words we annex the ideas of happineſs, and plentiful means of ſubſiſtence univerſally diffuſed among a vaſt number of inhabitants, we ſhall ſcarce find any thing more inadequate to ſuch deſirable purpoſes, or rather, more inconſiſtent, if not totally oppoſite to them.

The richeſt and moſt powerful people we read of in hiſtory were the Jews. The whole of their territories, even in their moſt extended ſtate, did not exceed the kingdom of Scotland in magnitude, but the population was prodigiouſly greater. From the account we have of David's numbering the people, it appears

appears, that thoſe capable of bearing arms were upwards of a million and a half, excluſive of the tribes of Levi and Benjamin. Suppoſing, therefore, the fighting men in a nation to be only one fourth of the whole, we can ſcarce imagine the number of the Jewiſh nation, at that time, to have been leſs than eight millions: Nearly as many as, by a reaſonable calculation, can be ſuppoſed to exiſt in the whole iſland of Britain at preſent.

If we compare theſe numbers with what we read of the moſt celebrated nations of antiquity, we ſhall find the population of Judea incredibly ſuperior to that of any of them. When Sidon was deſtroyed by Ochus King of Perſia, the heads of families and warlike inhabitants are ſaid not to have exceeded 40,000. Nor does the population of Tyre ſeem to have been much, if at all ſuperior; for that city was totally depopulated by Alexander the Great, when he crucified 2000 of the inhabitants, and ſold 30,000 for ſlaves. Carthage ſeems to have been the moſt populous, as well as the moſt powerful commercial city we read of. Though, with regard to the number of its inhabitants we are much in the

dark. The great quantity of money, indeed, imported into that city, enabled them to hire vaſt numbers of mercenaries for their wars: But this inſtead of evidencing the *ſtrength* of their empire, was an undoubted proof of its weakneſs; as was particularly manifeſted after the firſt Punic war, when the whole force of Carthage was ſcarce ſufficient to repel that of their revolted mercenaries.

With antient Rome, which was not a commercial city, the caſe was quite different. The number of people there was ſo immenſe, that King Pyrrhus compared them to the fabulous hydra, of which one head was no ſooner cut off, than a new one ſprung up in its ſtead. The population of antient Rome, indeed, according to the accounts tranſmitted to us, ſeems to have been almoſt incredible. Though engaged in endleſs wars, which might naturally have been thought ſufficient to counteract any advantages with reſpect to population their circumſtances could afford; yet, before the ſecond Punic war, when threatened with an invaſion by the Gauls, they were able, not only to repel thoſe barbarians, by dint of ſuperior military ſkill and

diſcipline,

diſcipline, but even to outnumber them; the Roman army at this time conſiſting of little leſs than 900,000 men. It is true, that at the time we ſpeak of, they had the whole of Italy in ſubjection: But we are not from thence to infer, that they derived this ſtrength from their Italian allies; on the contrary, when invaded by Hannibal, deſerted by many of their allies, and weakened by many dreadful defeats, they found themſelves ſtill able to ſupply *men*, even when they were almoſt deſtitute of *arms*: So that they could muſter armies ſufficient to chaſtiſe their ungrateful allies, and render fruitleſs the aſtoniſhing military efforts of Hannibal; nay even to tranſport forces into Macedon, in order to prevent an invaſion from thence.

In more modern times, we find the moſt commercial ſtates far from being the moſt populous. The Venetians, though once powerful, and famed for military exploits, are dwindled into inſignificance proportioned to the ſmallneſs of their number; and though they ſtill continue formidable to their barbarous rivals the Turks, are yet of very ſmall conſequence in compariſon of any of the powerful nations of Chriſtendom.

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The moſt populous, and richeſt commercial nations on earth at preſent, China excepted, are the Britiſh and Dutch, eſpecially the former; though it cannot by any means appear, that they derive thoſe advantages from their commerce. Indeed, from a very ſlight view of the preſent ſtate of our own nation, it muſt be evident, that its commercial advantages for ſome time paſt have been bought too dear. We ſhall not doubt, that whatever wars have been entered into for fifty years paſt, have been for the ſake of protecting and increaſing the commerce of the nation; neither ſhall we doubt that they have fully anſwered the purpoſe. But what is the conſequence? More than 200 millions of national debt, beſides many millions expended annually to ſupport the war; and ſuch a number of taxes to pay the intereſt, that the whole produce of the commerce ſeems not ſufficient to balance the expence: At the ſame time that our population ſeems ſo far from being on the increaſe, that perpetual emigrations take place to different countries; as if our own was ſtill inſufficient to maintain thoſe who are born in it.

It is to little purpoſe to enter into any detail

tail of the particulars by which this enormous expence has been incurred, with a view to alleviate it. Vaſt ſums have been expended in the German wars, but theſe were ſuppoſed neceſſary to the well-being of our commerce, and ought now to be ſtated as commercial expences, as much as the ordinary requiſites for trade.

The American colonies were alſo very expenſive for more than a century; Britain has expended, if we take into the account accumulated intereſt, above a thouſand millions in ſupport of them, (ungrateful America!) if that ſum had been laid out for the improvement of Britain, what a figure would ſhe have made this day, but this expence was incident to commerce, for it was only in the commercial line that they were ſuppoſed to be beneficial to this iſland. If they have now ungratefully withdrawn their allegiance, as we ſay, or unable to bear the Britiſh yoke, as they themſelves ſay, we muſt only reckon this to be an adventure in the commercial way, and ſuch as may be expected by every nation which endeavours to monopolize the trade of the whole world.

To

To the ſame account we muſt alſo place the hundred millions expended in an unſucceſsful attempt to reduce the rebellious colonies; nor is it any thing to the purpoſe whether the colonies could, or could not have been reduced; whether our generals behaved well or ill; or whether we had the right or wrong ſide of the queſtion.

Let our opinion with regard to theſe particulars be what it will, the event is manifeſt, that adventuring deeply in commercial ſchemes is dangerous for a nation, as well as an individual; and, with reſpect to our own particular caſe, the fact is undoubted, that all our attempts to aggrandize ourſelves have ended in the loſs of money, embarraſſment of our affairs, and conſiderable diminution of our national character.

Perhaps, it may be ſaid, that the errors committed in the management of any ſcheme are not to be attributed to the ſcheme itſelf; and, of conſequence, that the folly of the Britiſh miniſtry, in not ſending a ſufficient force, under the command of generals (that could be truſted) in due time, to ſubdue America, is, by no means an evidence of the inſufficiency of a commercial plan for the aggrandizement

grandizement of the nation. There was, indeed, a poſſibility, that, by conſtantly keeping a very great ſtanding army in America, the colonies might have been retained in ſubjection; but then, it would have been neceſſary to have kept this force there from the beginning of the ſettlement with ſtrict diſcipline; to have perſevered in it, and to have increaſed it as the colonies grew in ſtrength: Nor can we, from what is paſt, calculate the force requiſite to have ſubdued them at the time of their revolt, at leſs than 100,000 men, ſo that, in all probability, the expence would have been greater than all the benefits which could have been derived from our connection with them.

It muſt be owned, that, if the Americans had been checked when they were but a mob, a leſs number would have ſerved the purpoſe; the error was, allowing them to get to ſuch a head at firſt, and in many in Britain eſpouſing their cauſe. So that it might be ſaid, that America was loſt in Britain; and this is the more to be believed, as it is certain that their friends told plainly in parliament, what ſteps the Americans ought to take, in order to render themſelves independent.

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With regard to our poſſeſſions in the Eaſt and Weſt Indies, as well as in Africa, it cannot be made to appear, that they are of any real benefit to the nation. Its population is certainly not increaſed by them; but, on the contrary, very much diminiſhed. The unhealthineſs of the iſland of Jamaica and the continent of Africa, has procured them the name of the *graves* of Engliſhmen, nor is the continent of Aſia much better in this reſpect; not to mention the immenſe ſums expended for the protection of the colonies, and the total annihilation of morality among thoſe who go to the Eaſt Indies in order to make their fortunes; as well as the immenſe ſums of gold and ſilver ſent to the Eaſt Indies to purchaſe goods which we might eaſily be without.

Schemes of foreign commerce and colonization, however, ſeem to be ſo great favourites of the Britiſh government, that no experience of paſt ill ſucceſs, nor proſpect of future expence, ſeem to be ſufficient to deter them from purſuing the ſame deſtructive plans.

The frozen regions of Nova Scotia have coſt immenſe ſums, never to be repaid by any thing that country can produce; and which, perhaps,

perhaps, at a future period, may be taken from us with all the improvements we have made. And, as if this fine colony had given ſuch great encouragement in the northern hemiſphere, we are now about to have another of the ſame kind in the ſouth; the ſucceſs of which is even more uncertain than that of Nova Scotia, as the burning regions of the torrid zone, for more than 40 degrees latitude, muſt be croſſed before we can get at it.

The iſland of New Holland is ſituated in a climate by no means the moſt agreeable; its productions are, as yet, unexplored; different, indeed, they certainly muſt be from thoſe of this country, but how far they can be of ſervice to us, in preference to our own, muſt certainly be very doubtful. One thing is certain, that before any of theſe can be conveyed to Britain, they muſt coſt ten times more than they can poſſibly be worth.

The coloniſts, it ſeems, are to be moſtly compoſed of thoſe, who, for their crimes, are reckoned unfit to ſtay in this country. This may, at firſt, ſeem to be a piece of good policy, but it will require no great judgement in calculation to foretel with certainty, that they muſt thus be much more expenſive to the na-

tion, than they could poſſibly have been by keeping a guard over them, while they were employed in carrying on ſome public works. Their being conſtantly confined to labour in public works would ſtrike a greater terror into their accomplices, than death itſelf; as a perſon accuſtomed to idleneſs would almoſt rather be hanged than work. The iſland, to which they are to be tranſplanted is inhabited by ſavages, who will not fail to reſent the ſettlement of theſe new comers in their territories. Nor is it at all probable, that ſuch coloniſts will long refrain from giving provocation. The conſequences, undoubtedly, muſt be, frequent ſcenes of ſlaughter, accompanied with circumſtances of the moſt dreadful barbarity. To prevent theſe, as much as poſſible, a very conſiderable military force muſt conſtantly be kept there; as well as to prevent diſorders among thoſe wretches who compoſe the colony. Nor is it all improbable that this wretched ſettlement may excite the jealouſy or avarice of ſome other power, by which we may be involved in a new war, not to be got rid of for leſs than fifty or ſixty millions. To all which we may add, that the expences of this colony will undoubtedly

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be greater than thoſe of keeping a guard over them while employed in making of high roads, canals, or working in mines.

So great, indeed, is the rage of colonization, with which this country for a century paſt has been infected, that one would be tempted to think, there was not a foot of our own land that was not improved; the contrary of which is notoriouſly known, as ſhall afterwards be particularly taken notice of.

Previous to this, however, we ſhall a little more fully conſider the ſtate of the different nations who have applied themſelves to commerce, and whoſe grandeur we ſhall always find to have been more ſpecious than ſolid.

Among all the nations of antiquity, we ſhall ſcarce find one whoſe rage for colonization equalled our own, Athens only excepted. The territory of Attica was barren, the people reſtleſs, idle, and fickle; and prone to war, rapine, or any thing rather than the improvement of their country.

So great was their averſion to this, that Piſiſtratus was reproached as a tyrant, becauſe he obliged them to apply to agriculture, and reſtrained the mob, by whom eve-

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ry thing, before that period, had been managed, from committing their usual outrages. It may indeed be observed, that when people once have got an inclination for a martial life, they cannot by any means be induced to apply, either to commerce, agriculture, or manufactures.

The Athenians by their commerce with different nations, but more especially by their depredations on the effeminate Persians, had acquired very considerable wealth; but so little was population encouraged by the possession of this wealth, that in the most flourishing æra of this city, it never could produce 20,000 men capable of bearing arms. Hence, notwithstanding all this apparent grandeur, this celebrated state had no solid foundation; and it was rather owing to the want of a proper enemy, than to any intrinsic strength, that it made such a figure among others.

This was, indeed, the case with all the states of Greece; and therefore, by reason of their want of inhabitants, every one of them was in danger of being overthrown by a single defeat. The victory of Leuctra, where 4000 Spartans were killed or taken, had almost ruined the state; and it was only owing

ing to a ſimilar want of inhabitants in Thebes, by which they were diſabled from ſupporting their general, that the Spartan republic was not then totally overthrown.

A ſingle defeat by Lyſander ruined the Athenian ſtate, and occaſioned the loſs of the city.

The ſingle battle of Cheronea ruined all Greece, merely becauſe they had no men to replace thoſe who were loſt at that time; although their numbers were by no means very conſiderable.

It is almoſt incredible, that a city incapable of furniſhing an army of 20,000 men, ſhould aim at univerſal empire; yet, it is certain, that the inhabitants of Athens reckoned their power irreſiſtible, and fancied themſelves able to ſubdue the whole world.

We laugh at abſurdities of this kind, without conſidering that we ourſelves are chargeable with a ſimilar folly. We have graſped at the dominion of both ends of the earth, and we ſucceeded in acquiring it, when we had only ſuch enemies to contend with, as the Greeks found in the ancient Perſians. But, when we engaged with thoſe who where ſomewhat more upon an equality with us, in point of

of military ſkill, the caſe was altered. General Howe, finding himſelf unable to accompliſh the conqueſt of America with the force originally ſent, wrote to the miniſtry for a reinforcement, firſt of 20,000, and then of 15,000 men. They were not ſent; and why? becauſe the population of the country was not ſufficient to ſpare ſuch a number. This had, indeed, been originally put to the trial, when the firſt army was ſent to America, and where, in order to complete a force of 56,000 men, we were obliged to hire 17,000 mercenaries from the ſmall ſtates of Heſſe and Brunſwick. But, how came theſe pitiful ſtates to be able to ſpare ſo many men? The anſwer is plain, they are not commercial countries, and, therefore, they are ſtrong and full of people; while Great Britain, notwithſtanding her ſplendid ſhew of power and riches, is, in reality, weak, and unable to ſtand any conteſt which requires a conſiderable number of men to ſupport it.

This was further manifeſt throughout the whole conteſt with the Americans. The army under General Burgoyne did not amount to 10,000 men; nevertheleſs, the loſs of it threw us into the utmoſt deſpondency, while

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the capture of Lord Cornwallis, with about 7,000 more, obliged us fairly to own ourſelves overcome, and to conclude peace upon any terms we could get. Theſe, it muſt be owned, were terrible diſaſters; but what became of all our ſucceſs? Were not the victories at Long-iſland, at Brandy-wine, at German-town, Savannah, Charleſtown, Cambden, Guildford, &c. &c. able to balance two defeats; eſpecially when it is conſidered, that, in every action, the enemy loſt two or three men for every one that periſhed on the Britiſh ſide; at leaſt, if we may believe the accounts publiſhed at the time. The conſtant cry was, that the Britiſh were overpowered by numbers: But whence did theſe numbers come? At the beginning of the conteſt, the Americans themſelves only ſtated their numbers at three millions; but this was not one third of the computed number in Britain and Ireland, with whom they had to contend. The numbers of the Americans, at firſt, were but ſmall, if they had met with a proper check; but, they were rather encouraged by commanding officers not doing their duty, and the generals not co-operating with one another. Add to this, that, in every action, the Americans

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loſt two to one. They contended with Britain, therefore, under the immenſe diſadvantage of two to one, which, undoubtedly, muſt have made up for the diſtance to which the Britiſh forces were to be exported. The French, it is true, aſſiſted the Americans, but the force they ſent amounted to no more than 10,000 land forces, which was more than balanced by the 17,000 Germans, by whom Britain was aſſiſted. As for the fleets on both ſides, they muſt be conſidered as entirely out of the queſtion, and only calculated to let both parties try their ſtrength by land; for no engagement of any conſequence happened by ſea, till after the affair of Cornwallis was decided; nor were the French fleets ever able to hinder the Britiſh from ſending as many troops as they pleaſed to America, during the whole courſe of the war.

What I have juſt now ſaid is with no view to depreciate the Britiſh, or to exalt the Americans, but to lead to the eſtabliſhment of the following poſition, (though this, in a great meaſure, was owing to the diſtraction of our councils at home, as, had we been united, America could not have obtained ſuch a footing at this time) that the Americans, for ſix

years,

years, contended with the moſt powerful and moſt commercial nation in the world, under the prodigious diſadvantage in numbers of two to one at firſt; and yet at laſt overpowered by numbers all the armies which that nation could tranſport, owing to their being in their own country. Add to all this, that, during the time of the American war, our commerce and manufactures flouriſhed more than ever, while that of our enemies was utterly deſtroyed, and great numbers of their towns burnt. Some cauſe therefore muſt be found, by which the population of America continued undiminiſhed, nay, ſeemed rather to increaſe under all the calamities of war, while that of Great Britain, though at a diſtance from all theſe calamities, was by no means increaſed.

To find out this cauſe, we muſt again take a review of the hiſtory of mankind from the earlieſt ages.

The Jews, as has already been obſerved, were the moſt populous, and ſtrongeſt nation upon earth, in proportion to the extent of their country. They were under the peculiar tuition of the Deity indeed; but ſtill we know, that natural means were employed for the

ſubſiſtence of the people; and whatever theſe means were, we are ſure, that they muſt, of all others, be the moſt fit for increaſing the number of inhabitants in any country whatever. Theſe means, in one word, were *agriculture*, and that, no doubt, on the beſt plan that could poſſibly be deviſed; of which, however, we ſhall perhaps have occaſion afterwards to ſpeak more particularly. Here, it may be obſerved, that their courſe of labouring ſeems to have been perfectly uniform; having a ſeventh year's reſt. Great part of the ground was probably laboured with the ſpade; and as it was called, a land flowing with milk and honey, we may hence conclude, that part of it was in graſs, and part in corn. From this alſo we may learn, that one ſyſtem of huſbandry ſhould be univerſally uſed throughout the kingdom.

Commerce was not introduced till the days of Solomon; and then, though it enriched the nation, they complained that they were oppreſſed by it, and wiſhed for a relief from their burdens. Afterwards, when commerce was totally annihilated, they continued very numerous, as was evident at their final deſtruction by the Romans, when upwards of

a million of them were deſtroyed at once at Jeruſalem, after the moſt prodigious devaſtations in other parts of Judea, and all this without exterminating the nation; who, though diſperſed into different nations, ſtill continue very numerous.

The Romans, as we have alſo remarked, were exceſſively numerous; and to the very ſame cauſe are we to aſcribe their vaſt population. In the infancy of the republic, we are told, that the principal inhabitants of the city *followed the plough*; and every one has heard of the celebrated warrior Cincinnatus, who was called from the plough to command an army.

The policy of the Greeks was entirely different from that of the Romans. The effeminate Perſians preſented an eaſy prey, and held out, as it were, wealth and every kind of luxury to the warlike Greeks, with little or no trouble in the taking; for the Perſians were by no means able to contend with them almoſt in any number. Hence it was as faſhionable among the Greeks to plunder the Perſians, as it is now to trade to the Eaſt and Weſt Indies. The conſequences were the

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ſame to both. The Greeks continued a divided handful, invincible in equal numbers by any nation on earth, but utterly unable to export any number of forces ſufficient for great foreign conqueſts. Alexander the Great, indeed, with the whole force of Greece and Macedon united, conquered Aſia; but in doing this, he expended the whole ſtrength both of Greece and Macedon; the conſequence of which was, that none were left at home to controul the power of that army, who therefore did what they pleaſed; and having, under the conduct of Alexander, conquered Aſia, returned, under other leaders, to conquer both Greece and Macedon, and utterly to exterminate the family of their king.

But, however much, from the hiſtory of the conqueſt of Aſia by Alexander, we may reckon the Greeks fitted for war and victory, they were found utterly unable to eſtabliſh any empire over thoſe nations who had any tolerable ſkill in the profeſſion of arms. Alexander the Great had ſcarce accompliſhed the conqueſt of Aſia, when his nephew, Alexander king of Epirus, undertook the conqueſt of all

Europe.

Europe. He began with Italy, but the nations there were more warlike than thoſe of rhe Eaſt. Still, however, they were by no means able to ſtand an engagement with the Greeks, but, though frequently defeated, unleſs Alexander's army had been much more numerous than it was, he could never have eſtabliſhed any permanent conqueſt over them. He, therefore, failed in his attempt, and loſt his life, after having performed ſuch exploits as well entitled him to a relationſhip with the great Alexander.

On the other hand, the Romans proceeded in a quite different manner. They were, originally, a poor colony, and ſituated in the midſt of nations more powerful than themſelves. Being of a martial diſpoſition, however, and having a very ſkilful commander, ſome victories were gained, and one or two cities taken, the inhabitants of which were tranſplanted to Rome; and thus the city received an increaſe of power, and became more able to contend with any ſucceeding enemy. In all their wars, alſo, the Romans had a particular eye to the *lands* of the conquered. They never thought of firſt procuring wealth by commerce, or even by plunder, and then

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purchaſing land with the fruits of their commerce or rapacity; their primary object, always, was the poſſeſſion of land; and ſo exact were they in the improvement of it, that, in the early ages of the republick, a ſingle acre was ſufficient to maintain a Roman family; which, it may be ſuppoſed, was laboured with the ſpade. Hence, it is eaſy to account for the numbers of people with which ancient Rome abounded, as well as the eaſe with which her armies were recruited, in caſe of any misfortune.

In proceſs of time, it became neceſſary to ſend forth colonies from the city, and theſe were ſent out, not for the purpoſes of commerce, or traffick, but for thoſe of agriculture. The coloniſts were complimented with the citizenſhip of Rome, by which means they were attached to the parent ſtate. There is good reaſon to believe, that the firſt improvements in agriculture, Britain received from the Romans, who did much with the ſpade, at the ſame time that vaſt armies were every where kept on foot, ſufficient to prevent diſturbances in the countries where colonies were ſituated, as well as to defend them from the incurſions of barbarians. By ſteadily

dily purſuing this method, the Romans became, at laſt, in appearance, invincible by any power on earth, as they not only poſſeſſed a great degree of military ſkill, but were capable of overpowering, by numbers, the few nations who could contend with them, for a ſhort time, in the field; and, had it not been for their diſſipation and diviſions, the certain forerunners of deſtruction to all empires, they might have continued much longer.

In the time of the firſt Punic war, Hamilcar, the father of the great Hannibal, clearly perceived the ſources from whence the immenſe power of the Romans was derived. He, therefore, projected the conqueſt of Spain, a country equal, in extent to Italy, and which, of conſequence, would be capable of furniſhing ſufficient reſources for recruiting his armies, in time of war, without having recourſe to the dangerous expedient of hiring mercenaries.

It would be foreign to our purpoſe, to enter minutely into the cauſes of Hannibal's failure, in his attempt to ſubdue the Romans. It is ſufficient to obſerve, that his countrymen differed totally in their ideas, and fancied themſelves

themſelves great, only in conſequence of the quantity of ſilver they could extract from the Spaniſh mines, the eſtates they could boaſt of in that country, or the money they could procure by means of trade. In theſe early ages, the kingdom of Spain abounded with ſilver mines, perhaps equal to any of thoſe in the new world, but, which were quickly exhauſted, by the inſatiable avarice of the Carthaginians and Romans. To theſe things, therefore, they applied themſelves, leaving the brave general to ſhift for himſelf, and, at laſt, to fail in the conqueſt of a country where he had remained for 17 years, in defiance of the moſt warlike nation in the world, and, in oppoſition to the beſt commanders they could produce againſt him. So ſenſible, indeed, was Hannibal of the neceſſity of agriculture, that, even while in Italy, he ſometimes employed his men in planting olive trees, and, when he returned to Carthage, did every thing in his power to encourage and promote that moſt uſeful art.

During the long tract of time, in which agriculture was the principal occupation of mankind in time of peace, and commerce but

little

little known, we find thoſe nations who applied themſelves to it, very ſtrong, and capable of reſiſting the moſt powerful enemies. The northern barbarians, indeed, who invaded the empire, were as ignorant of agriculture as of commerce. They deſtroyed and depopulated, therefore, every where, to ſuch a degree, that the Romans, numerous as they had been, but now much enervated by diviſions among themſelves, and diſſipation, were almoſt entirely exterminated; while their ſavage conquerors found themſelves in danger of ſtarving from the effects of their own devaſtations. Agriculture, therefore, once more, became the general object, and, while it continued to be ſo, the European nations, notwithſtanding their continual wars among themſelves, were numerous and ſtrong; ſo that, when the rage of cruſading commenced, they were able to ſpare a million of warriors at once, not only without diſadvantage, but to the very great emolument of thoſe who were left; as thoſe warriors were the perſons, who, under pretences of glory and honour, kept every nation in Europe in a ferment.

Hiſtory, however, is not at preſent our object. Every one knows, that, with the cru-

ſades ceaſed all that violence of war which had for ſo long depopulated the weſtern parts of the world. Since that time, the arts of peace have gradually prevailed, the horrors of war have been mitigated, battles have been reduced, comparatively, to ſkirmiſhes, and learning and the arts have increaſed to a degree unknown ſince the foundation of the world.

By what means, therefore, ſhall we ſolve this paradox, that, while different nations waged perpetual war with each other, mankind were not thinned, and now, when they, comparatively, live at peace, their numbers are not increaſed. Nay, to add to our ſurpriſe, in this reſpect, we muſt take into our account the much greater frequency of plagues and famines in former times than now. To what ſecret cauſe, then, are we to aſcribe this hidden and inviſible deſtruction of our ſpecies, which, amidſt the appearances of peace and plenty, proves an equivalent to all the ravages of war, famine, and peſtilence! Nay, which actually ſeems in a great meaſure ſuſpended during our modern wars, as the loſs of men by them is ſcarcely felt more than in time of peace?

The

The cauſe, indeed, beſides the diſſipation already mentioned, may be traced as far back as the time of the cruſades themſelves, when the view of eaſtern magnificence firſt inſpired the Europeans with a deſire of running hither and thither in queſt of luxuries and finery. No ſooner was this idea entertained than the invention of the mariner's compaſs put it in the power of mankind to gratify their wandering inclinations, and Africa firſt, and afterwards the Eaſt and Weſt Indies quickly became receptacles for crouds of adventurers from all nations in Europe. Thus, the attention of mankind was drawn from the improvement of their own country, towards the importation of commodities of which the diſtance from whence they were brought very often conſtituted the greateſt value; and thus, to the preſent day, every European nation has continued, like the daw in the fable, to dreſs herſelf in borrowed plumes; without conſidering, that, theſe being very liable to a removal, may ſoon leave them naked and deſtitute, even of what they might otherwiſe poſſeſs.

It is evident, therefore, that before any nation attempts either foreign trade, or foreign conqueſt, the territory properly be-

longing

longing to it ſhould be improved, and made to yield all that it is capable of yielding; for thus only it can be poſſeſſed of any ſuperfluous ſtrength, that can be exerted with propriety in adventures either of trade or conqueſt.

Of all nations in the world, I have heard only of one, which, according to our preſent method of reckoning, is in a condition to undertake projects of this kind; and that is, the empire of China. All the accounts we have of that vaſt country, repreſent it as improved in the higheſt degree, and ſo full of inhabitants, that they have exhauſted every reſource for ſubſiſtence, whether derived from agriculture, internal fiſheries, or even commerce: Though in this laſt they never chuſe to venture far; as a fooliſh attachment to their own country would prompt them to ſtarve in China, rather than go out of it, in order to find ſubſiſtence.

In that country many people, for mere want of room, as they ſay, are obliged to ſtay in wooden houſes, conſtructed upon floats in the water; and ſome cities are ſup-

poſed

poſed to contain two millions of inhabitants each.

The ſtrength of this country would evidently be increaſed by ſending forth colonies; as ſuch immenſe population could well ſpare the emigrants, afford ſufficient force to defend them; and thoſe who remained, by having more room, would be able to ſubſiſt more comfortably.

It is needleſs to adduce more examples, in order to prove, how much the encouragement of agriculture promotes the real intereſt of a nation. By application to this moſt uſeful art, not only the population is increaſed to an incredible degree, but the wealth is augmented in equal proportion.

Few nations, in this or any other age, have paid that attention to agriculture which it deſerves. The Chineſe, in the preſent age are almoſt the only exception. In that country, agriculture is carried to the greateſt perfection that perhaps the nature of the ſoil will permit: And as their hills are cultivated to the very top, it is moſt reaſonable to think, that this is done by means of the ſpade, and the bare rocks covered with earth. The conſequence

ſequence is, that the nation is by far the moſt numerous, as well as the richeſt of any in the world. The revenues of the Emperor of China exceeded thoſe of the Great Mogul, even when he was in the height of his ſplendor; yet this mighty monarch, by an annual proceſſion, in which he himſelf holds the plough, never fails to acknowledge the obligation he owes to agriculture.

The amazing increaſe of population is no where more evident than in this great empire. When invaded by the cruel Moguls, whoſe principle of conqueſt was to deſtroy every human creature in the countries they invaded, it is incredible what multitudes were cut off; yet the Chineſe not only ſoon recovered themſelves, but even civilized their conquerors. The ſmalleſt trace of this invaſion does not now remain in that country; though in the weſtern parts of Tartary, where ſimilar devaſtations were committed, and where the inhabitants chuſe paſturage rather than agriculture, the country has never regained its former populouſneſs.

Agriculture, therefore, being the only proper means for making a rapid increaſe of population,

population, is likewiſe the only proper foundation of arts, manufactures, and commerce. This is likewiſe manifeſt from the example of the Chineſe, among whom commerçe is carried to an incredible height; and the arts are come to as great perfection as can poſſibly be ſuppoſed in a country where the ſelf-conceit of the inhabitants makes them think themſelves ſuperior to all the reſt of the world.

In all countries theſe muſt be ſomewhat unfavourable to population. Commerce is particularly ſo, by carrying people out of their own country into foreign climates, which is more deſtructive than even the ſword of an enemy. This is evident even from the accounts which, from time to time, are publiſhed by authority, of thoſe aboard his Majeſty's navy who die natural deaths, and thoſe killed in battle.

From an account of this kind, publiſhed in January 1781, it appears, that from the year 1774 to 1780, there were raiſed for the ſervice of the navy 175,990 ſeamen: Of theſe, from the beginning of 1776, to the beginning of 1781, there had fallen in battle only

ly 1243; though, in the ſame ſpace of time, no fewer then 18,545 had died naturally.

The ſame account preſents us with a moſt ſuſpicious article, under the title of *deſertion*, and which includes 42,069. In what manner it was poſſible for ſuch a number as 42,000 ſailors to find an opportunity of deſerting from the royal navy, will undoubtedly ſurpaſs the comprehenſion of vulgar intellects; unleſs by *deſerters* we mean priſoners of war, thoſe who periſh in the ocean, as well as deſerters properly ſo called; for the account alluded to gives no liſt of either of theſe. Upon this, however, or ſomething ſimilar to it, we muſt make our calculation. It cannot be ſuppoſed that leſs care is taken to preſerve the lives of ſeamen in the royal navy, than in the trading ſhips fitted out by private adventurers, and they are evidently more free from the hazard of ſtorms and ſhipwrecks, becauſe the men of war are much ſtronger and better ſailers than the merchant ſhips. Every circumſtance conſidered, therefore, we muſt ſuppoſe the deſtruction of mankind to be no leſs by the veſſels employed in commerce, than on board the ſhips of war; nor can we eſtimate the

the number of thoſe employed in maritime affairs, including the ſailors on board the navy, kept up in time of peace, at leſs than between one and 200,000 men: But of theſe, according to the data with which we are already furniſhed, we cannot ſuppoſe that fewer than 30,000 are annually loſt to their country; including ſuch as die a natural death at ſea, thoſe who go into foreign countries and never return, who periſh by ſhipwreck, by the uncommon diſſipation natural to ſeafaring people, &c.

It is needleſs to expatiate on this ſubject, in order to ſhew how much population would be increaſed were that number to ſtay at home, marry, and have children; the thing is ſelf-evident.

Arts and manufactures are unfavourable to population, rather in an indirect manner. Agriculture, we know, was the employment for which man was originally deſigned by his Maker; and therefore it is more natural and friendly to the conſtitution than any other. Many of the trades which man has invented for himſelf, evidently tend to ſhorten his days, either by the confinement neceſſary for carrying them on, or the pernicious na-

ture of the materials from which the commodities are produced.

But the worſt conſequence of theſe is, that they aſſemble the human ſpecies together in too great numbers, ſo that vice of all kinds obtains a much more firm footing among them than it can do when they are diſperſed. Hence all great cities are exceedingly unfavourable to population. The unwholſomeneſs of the air produces diſeaſes; the inhabitants enervate themſelves by intemperance and debauchery; and the multitudes of proſtitutes with which they abound, not only deprive the public of the ſervice which might be expected from them, but likewiſe of their poſterity; and their example communicates itſelf to the country.

On this diſagreeable ſubject, however, we cannot enter into particulars at preſent. Every reader muſt aſſent to the truth of what we have advanced, and may make the calculation in what manner he thinks proper.

To evince the truth of the general point for which we have contended in this ſection, by further arguments, is unneceſſary. To confirm our reaſoning, we ſhall, however, here add a few extracts from an ingenious writer,

writer*, who has alſo endeavoured to awaken the attention of mankind to the ſuperior advantages of agriculture above manufactures and commerce.

P. 31. " The produce of the earth is the " natural revenue of every nation: It is a " benevolence, or free gift from God, as the " proper and immediate maintenance of his " creatures; and a thrifty management of it " ſettles the tempers of the people to an affec- " tion for their rulers: It opens a credit with " foreign countries, and multiplies reſources " to ſupply every artificial want. It is the " ſoul of commerce, and the ſinews of au- " thority. It preſerved Rome, and ſecured " Hiero in the poſſeſſion of Sicily."

P. 37. " Four years after Dioclesian had " retired from the toils of government, to " enjoy the tranquility and eaſe of a private " perſon, Gallerius warmly ſollicited him to " reſume the throne; but Dioclesian, with a " philoſophical indifference, ſtopt his impor- " tunities, by this ſimple but ſignificant in- " terrogation: " Did you ſee, Gallerius, the " plants raiſed with my own hands at Salo- " na?" Could language convey a ſtronger " proof, that Dioclesian was better ſatisfied " with

* Agriculture conſidered, in a ſeries of letters inſcribed to his Majeſty, by W. Donaldſon, Eſq. late ſecretary to the governor of Jamaica.

" with his vegetable dominion, where all his
" ſubjects were governed by one principle of
" action, and directed to the end for which
" they were deſigned, than with the empire
" he had quitted; where, from the depra-
" vity of human nature, nothing but diſap-
" pointments could be expected."

P. 38. " Thus, upon a curſory review of
" the ſtate of agriculture, through different
" ages, from the earlieſt time, we find it a
" favourite ſcience with men of the moſt
" ſublime and accompliſhed virtue in all na-
" tions. It was a relaxation from the toils of
" war, and the ſeverer ſtudy of epic magni-
" ficence. An attention to huſbandry is a
" compliance with the inclination of God:
" For the produce of the earth is interpreta-
" tively an intimation from the Almighty to
" cultivate it; and by making the moſt of
" his bounty, we not only eſtimate its value,
" but manifeſt our gratitude for his paternal
" indulgence."

P. 74. " Commerce enriched the nation,
" but waſted its inhabitants: the country
" was drained of its moſt uſeful people, to
" furniſh cities and towns: London, in par-
" ticular, tumified to an alarming ſize, by

" the

" the charms of voluptuouſneſs, and the at-
" traction of manufactories. Peaſants being
" familiar with health, were ignorant of the
" mighty bleſſing! Thoſe deluded people,
" with an unreluctant careleſſneſs, left the
" active buſineſs of the field, to encounter
" diſeaſes at the loom, and other ſluggiſh
" employments! Innocence loſt their affec-
" tion, when the country loſt their aſſiſt-
" ance; and their minds and their blood
" were corrupted in the ſame moment.

" This deſertion from the cauſe of induſtry,
" encreaſes the bills of mortality; multiplies
" hoſpitals; furniſhes the temple of juſtice;
" and, what is moſt melancholy, ſupplies her
" altar with victims! Againſt theſe alarming
" truths commerce maintained her ground:
" She found powerful friends in every go-
" vernment; and no wonder, as ſhe poured
" immenſe ſums into their reſpective trea-
" ſuries: Fiſcal laws are the political eſtates
" of every prince; and the paps which nouriſh
" the miniſterial polygarchy. Commerce, in-
" creaſed by encouragement, grew unwieldy
" by an injudicious indulgence; and declined
" by humours of her own generating: Com-
" merce, like other prodigals, never advert-
" ed

" ed to her conſtitution, but relied upon faith-
" leſs auxiliaries, for ſpirit and vigour."

P. 78. " Commerce is an avowed enemy to
" mankind: Kingdoms have been plundered,
" laid waſte, and the inhabitants butchered,
" to puſh her intereſt! How much blood has
" been ſhed to humour her jealouſies! How
" many millions have periſhed in her ſervice,
" by endemial diſeaſes, or ſwallowed in the
" ocean! and how many thouſands have been
" flattered out of the world, by her deceit-
" ful luxuries! Commerce gives countenance
" to every extravagancy, by tranſmuting the
" vices of mankind into relative virtues.

" Agriculture received her appointment
" from the hand of nature, and, like a faith-
" ful ſervant, has conformed to the inſtruc-
" tions of her great patroneſs; ſhe is a friend
" to mankind, ſhe ſecures him health, and
" appetite, and provides him food to main-
" tain one, and gratify the other; ſhe gives
" ſtrength to his body, and furniſhes him
" with materials to cloath and preſerve it:
" As an attentive handmaid, ſhe dreſſes up
" the face of nature in lovelineſs, and feaſts
" the eye of man with her incomparable beau-
" ties; add to all theſe real excellencies, ſhe,

" by

" by reſtraining his paſſions, entails upon
" him long life, with the enjoyment of peace,
" and abundance."

P. 81. " Huſbandry is the vital ſtream of
" commerce; it circulates through every part;
" it is the medium that tempers the whole;
" the artizan muſt be fed, and labour is va-
" lued by the liberal, or parſimonious pro-
" ductions of the earth; when cultivation is
" neglected, trade ſtagnates, and is only kept
" in motion by our own vanities; the conſump-
" tion of other countries muſt be ſupplied
" from a more reaſonable market. Plenty
" helps the ſtaple trade of this country, in
" another view; when proviſions are cheap,
" the poor are enabled to lay by ſome part of
" their wages for the comfortable purpoſe of
" cloathing themſelves and families. Oſten-
" tation riſes with abundance. Wretched-
" neſs is the companion of ſcarcity.

SECTION

SECTION III.

THE PRESENT STATE OF BRITAIN, WITH RESPECT TO AGRICULTURE.

IT may be thought a ſtrange thing to aſſert, that, with reſpect to agriculture, Britain, even at this day, is in a very poor ſtate of improvement. Yet, from undoubted facts, it is not only certain that this is the caſe, but that it is in a worſe ſituation in this reſpect, than it formerly was.

The firſt proof which I ſhall adduce of this is, that the farmers, in every part of the country, are daily failing. Superficial obſervers may perhaps ſuppoſe, that ſuch failures are owing merely to the extravagancy, folly, or misfortunes of the unhappy individuals. That luxury and diſſipation are too prevalent in the country, as well as in cities, we readily own; and that the miſmanagement of farmers is one cauſe, we ſhall quick-

ly

ly prove. But when bankruptcies univerſally prevail among farmers, the cauſes muſt alſo be univerſal. Theſe cauſes are indeed but too obvious. To every perſon acquainted with the preſent ſtate of the country, I appeal, for the truth of the following aſſertions.

By the impolitic conduct of ſome landlords, the rents of unimproved ground are raiſed much above their value. By a policy equally abſurd, others depopulate the country, by letting farms greatly too large; and by granting no leaſes but what are far too ſhort, their tenants are abſolutely prevented from making any real improvements. The farmers alſo, by following an improper mode of cultivation, greatly heighten their own diſtreſs. In many farms, we find the beſt ſoil laid down in graſs, and ſeldom broke up for corns; while the part that is ſown with grain is much exhauſted with conſtant cropping. To the above cauſes we muſt aſcribe the inſolvency of farmers, and the conſequent decreaſe of the produce of Britain.

What we have here advanced will be conſiderably illuſtrated by the following ſpirited

remarks of Mr Donaldſon; (vid. Letters, p. 93.) which afford a juſt, however melancholy picture of the preſent ſtate of farming in England.

" To maintain luxury, and gratify avarice, " rents were advanced to a moſt enormous " degree; farmers, to keep pace with their " landlords, advanced the price of the land's " produce in an unreaſonable proportion. " In this unpropitious change of affairs, in- " duſtry became the dupe of opulence; for " the few who ruled the markets were the " only gainers by the impoſition. The nee- " dy farmer, who has no greater intereſt than " in doing juſtice to his farm, is obliged to " ſend his goods to market, as his family " muſt be maintained from day to day; his " penury cannot reſiſt any prices that may be " offered him; his corn muſt be threſhed " out, when he has money to hire labourers " for that neceſſary ſervice; and his land re- " mains untilled, until temporary aſſiſtance " can be purchaſed, for which extravagant " wages are exacted. Thus raiſing his crops " at the greateſt expence, and ſelling them at " the loweſt prices, he is unprepared to reſiſt

" an

" an additional tax on his labour; he ſinks
" under the oppreſſive weight of an advanced
" rent; he is in arrears with his landlord,
" who being impatient under the difficulty
" of getting his money, removes the unhap-
" py pauper from his farm; and, without
" allowing himſelf to feel for his diſtreſs,
" drives the victim from his home, and con-
" ſigns his wife and children to languiſh in
" a workhouſe! From this diſhoneſt treat-
" ment, diſhoneſty is not ſufficiently un-
" derſtood in the idea of a houſe-breaker;
" for he is infinitely more ignominious,
" who, by deſtroying the induſtrious huſ-
" bandman, robs the public of his ſervice;
" and can, with deliberate barbarity, de-
" prive humanity of thoſe features which
" give a character to the nation! I repeat it
" again, from this diſhoneſt treatment, the
" family, who but lately was of ſervice to
" the public, is now become a burden to it;
" his few acres are given to a wretch, who
" had too many before, becauſe he will be
" more regular in his annual payments.

" Thus rents are raiſed, proviſions advan-
" ced, and the wages of labour augmented,

" to

" to the injury of the commonwealth, with-
" out any real or ſubſtantial benefit to the
" landlord, the tenant, or the labourer! If
" the landlord receives more money, he is
" not the richer, as he has involuntarily laid
" the above tax upon himſelf; for, if he has
" a genius for calculation, he will find his
" prodigality is rated higher than he has
" provided for in his additional revenue. Be-
" ſides, as we are generally diſpoſed to value
" our importance upon the ſum we annually
" receive, an augmentation of income will
" be apt to make us play a bolder game at
" the hazard table! multiply the number of
" our miſtreſſes! increaſe our plagues, in the
" increaſe of ſervants! and ſurfeit ourſelves
" upon the addition of twenty more covers
" every day upon our table. Or, in the o-
" ther extreme, avarice takes from the value
" of his hoarded treaſure, and diſpatches ſo-
" licitude and ſuſpicion, to invite anxiety to
" be the chief gueſt in their miſerable party.
" The tenant is under the ſame infatuation;
" his mind expands with his fortune, and
" he is viſited by paſſions that competency
" was a ſtranger to; or he buries the uſeleſs
" ſavings, wrung from every enjoyment of
" life.

" life. And the labourer works leſs, and
" lives more intemperately."

A further proof, that agriculture is declining is, that ſome years ago Britain exported corns to the amount of ſix or 700,000*l.* annually; while now we are obliged to import grain to the amount of three or 400,000*l.* and ſome years a million and a half, which makes a difference of more than a million a year to the nation; ſome years two.

Let any perſon in the leaſt degree acquainted with the preſent ſtate of Britain with reſpect to agriculture, only conſider what he himſelf knows to be the caſe; viz. the great difference betwixt the improvements in ſome parts of the country, and others of a ſimilar ſoil; both having the ſame means of improvement by lime, marle, dung, &c. and, in many places, fields lying contiguous to one another; the one producing large crops of corn and graſs, the other ſuch ſcanty crops of corns, that they will not pay for ſeed and labour; the one farmer growing rich, the other very poor; the very ſmall proportion that the improved part of the country bears to that which is not improved; the very large tracts of waſte land in every part of the country capable

pable of being made to produce good crops of corn and grafs, yet fuffered to lie barren, even near the metropolis of London itfelf, where dung is to be purchafed cheaper than in any other part of Britain, and in very large quantities. Though thefe are facts obvious to the infpection of every one, yet many people differ in their opinions concerning their caufes, as well as in the proper methods of applying a remedy.

If we may believe fome eftimates that have been publifhed of the number of people employed in manufactures of different kinds, the proportion is by far too great for the number of inhabitants.

By an account of this kind lately publifhed in the newfpapers, it would appear, that above five millions of people are employed in manufactures, &c. And though we cannot pretend to vouch for the exactnefs of this eftimate, yet it may be looked upon as a fact pretty well authenticated, that more than three-fourths of the inhabitants of Great Britain live in cities or towns, or are now employed in the various Britifh manufactures, commerce, fifheries, &c. But if this be the true ftate of the cafe, the number left to till

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the ground muſt be undoubtedly too ſmall. Yet the eſtimated produce of all the trade, manufactures, fiſheries, &c. amounts ſcarce to one half of that from agriculture.

In the account alluded to, this produce is calculated at fifty-one millions ſterling; although there is ground to believe, that this calculation is too little: But the produce of the ſoil muſt certainly be much greater, as may eaſily be demonſtrated in the following manner:

Let us ſuppoſe, that the number of inhabitants in Great Britain amount, according to the common calculation, to eight or ten millions; all theſe muſt ultimately be ſubſiſted and clothed by the produce of the ſoil, excepting ſome little aſſiſtance from the fiſheries, in moſt caſes too trifling to deſerve any notice. Let us next ſuppoſe, that the expence of maintaining each inhabitant of Great Britain amounts to *L.* 15 per annum; and we ſhall find the whole amount to the prodigious ſum of 120 or 150 millions.

An objection may no doubt ariſe, that this calculation is rated by far too high; as it is well known, that whole families make a ſhift to ſubſiſt upon leſs than the ſum here allotted

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to a ſingle perſon; but if we conſider at the ſame time, the great number of horſes, oxen, cows, aſſes, ſheep, ſwine, &c. that muſt likewiſe be ſupported by the produce of the ſoil, which is all included in the *L.* 15, we ſhall certainly find the eſtimate ſufficiently moderate. For all carriage and race horſes coſt *L.* 20, or upwards, per annum. Farm horſes, *L.* 10, milk cows, *L.* 5. The expence of hounds and other dogs is very conſiderable. The maintenance of ſheep, ſwine, and all the ſmaller kind of cattle muſt alſo be included in the calculation.

Taking the whole of this into conſideration, we may fairly conclude, That two thirds of the produce of the ſoil is expended on the brute creation; and conſequently, there remains only *L.* 5 per annum for the ſupport of each human creature. And, if we add, as before obſerved, that three-fourths of the inhabitants of Britain live in cities and towns, which is more expenſive than a country life: Conſidering, I ſay, the whole of this, the average of *L.* 15, for every human creature muſt be ſufficiently moderate; and conſequently, the produce of Britain, eſti-

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mating the inhabitants at eight or ten millions, cannot be leſs than 120 or 150 millions.

Beſides all this, the manufactured produce of the Britiſh ſoil, exported to other countries, is very conſiderable, and cannot be eaſily eſtimated; ſo that ſome have reckoned the whole produce of our iſland to be no leſs than 200 millions.

At any rate, we ſee, that the natural produce of our ſoil, according even to a very moderate computation, far exceeds the moſt exaggerated eſtimation of the produce and profit of our commerce, fiſheries, and manufactures.

Hence, again, it is obvious, how great an object it ought to be with government to encourage the improvement of our own country as much as poſſible, in preference to theſe ſecondary objects, which never can give real wealth or ſtability to a nation.

Indeed, the proper way of encouraging manufactures is by giving encouragement to agriculture; for thus, colonies are raiſed among ourſelves for the conſumpt of them; an internal commerce is inſtituted, which,

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with all the advantages of that to foreign countries, is entirely free from ſea-riſk, or the dangers ariſing from unhealthful climates; and therefore ought, as far as it can be puſhed, to be preferred to the other.

Mr Knox informs us, in his Tour through Scotland, 1787, "That the goods manufactured in England, and ſent to this country, amount to no leſs than two millions ſterling annually; and if it was improved according to the plans propoſed, the quantity would be more than doubled." He alſo ſays, in p. 169, "That, in 1697, the general amount of exports was found to be 3,525,906, of which was ſent to Scotland annually, upon an average of years between 1696 and the union of the two kingdoms, to the value of *L.* 63,345. Between the year 1707 and the commencement of the laſt war, the exports to Scotland had gradually riſen to *L.* 2,000,000. From theſe calculations it appears, that the exports to Scotland, in the courſe of 80 years, have increaſed thirty fold."

That the produce of Britain ſhould now be on the decline, conveys rather a melancholy idea; conſidering how ſevere a ſhock our commerce

commerce has lately received, and how much we are in danger of being rivalled by the other European nations.

That we have not yet arrived at that perfection to which the art of agriculture can easily be brought, is however evident, because there are not two counties, nay scarce two farms in England or Scotland, let them be ever so similar in soil and other external circumstances, which are cultivated in the same manner: And where any art whatever is not conducted by an uniform plan, it is evidently far from being yet arrived at any degree of perfection.

But the worst is, what hath been already hinted at, that the produce of Britain, within these few years, has certainly diminished, notwithstanding the many schemes and fancied improvements that have been undertaken with a view to increase it.

That the produce has diminished, even in one of the most highly improved counties in England; and that this diminution is owing to pursuing a very improper mode of cultivation, is fully evidenced by Mr Marshall, in his

his "Rural Economy of Norfolk," who obſerves, p. 84. and again p. 86.

"Minute 49. January 10. How ſtrong and "laſting is the current of cuſtom! The Nor-"folk farmers, while corn ſold high, were "aſſiduous to cultivate every inch the plough "could reach: Old marl-pits were levelled, "nooks and corners grubbed and broken up, "and even bogs were converted into arable "land. Graſs land, of courſe, became "wholly out of faſhion, and totally neglect-"ed. And now, when corn is low, the ſame "practice ſtill prevails. Scraps of arable "land are ſtill purchaſed at more labour "than they are ſometimes worth; while the "meadows are ſuffered to remain a diſgrace "to the country, notwithſtanding they would "pay trebly for improvement."

P. 86. "Minute 51. January 13. What a "diſgrace, and what a field for improvement "are the meadows of this county! The "farmers here hire marſhes and grazing "grounds at the diſtance of twenty or thir-"ty miles, and give high prices; when, at "the ſame time, many farmers might, with "a common ſhare of attention and manage-

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" ment, have them at a much cheaper rate
" within the limits of their own farms.

" But cuſtom and prejudice are doughty
" champions to deal with. Whilſt a Nor-
" folk farmer is beſtowing more coſt upon
" his arable land than, at the preſent prices
" of corn, he can ever regain from it, he
" is " doing rarely well by his land;" but
" the moment the foot of improvement ſteps
" on to his graſs lands, be it even to open a
" few gripes to let off the ſurface-water, the
" eyes of the country are upon him; for he
" is " buying his meadows." Were he to
" carry a load of muck from his par-yard on
" to his meadow land, a ſtatute of lunacy
" would be the probable conſequence.

" Prejudice, however, is not the only thing
" againſt the improvement of the Norfolk
" meadows. A want of knowledge in the
" art of draining, is a ſiſter-cauſe; for, of
" the few who attempt to drain their mea-
" dows, ſcarcely any are acquainted with the
" method of performing it properly. They
" make their drains much too ſmall, too nu-
" merous, and cut them in improper direc-
" tions; nor do they ever go to a proper
" depth

" depth to do the work effectually: For, " ſhould they chance to dip to a bed of gra- " vel they have done wonders, and there " they ſtop; for their ſpades and " mud- " crooms" can go no farther."

The ſtate of Norfolk is miſerable indeed. If the farmers continue this practice of having ſo much land in corn, and neglecting to ſow graſs, the country muſt, in a few years, be unavoidably ruined.

And if Norfolk, one of the moſt improved counties in England, is failing in its produce, what muſt be the ſituation of leſs improved counties?

Another more concluſive argument, that the produce of Britain is decreaſed, is, the diminution, or rather total abolition of exportation of corn, and the ſubſtitution of importation in its place.

But that which carries along with it the greateſt conviction is, the increaſed price of proviſions, at the ſame time that the farmers, ſo far from being enriched, are apparently much poorer than before. In ſome parts of the country, indeed, where they are carrying on improvements in a proper manner, the farmers ſtill continue to make rich; yet

yet it is evident, that the generality of theſe in the country are rather on the decline; and wherever the farmers are on the decline, the produce of the ſoil muſt neceſſarily decline alſo.

To all this may be added, that the country in general is depopulating very rapidly, by reaſon of the noblemen and gentlemen flocking into cities, and neglecting to improve their eſtates, to which many of them, within theſe few years, have paid great attention. This was, indeed, a very rational and agreeable amuſement: But now, truſting the moſt of their buſineſs to factors, many of whom are very ignorant of country affairs, they amuſe themſelves with the faſhionable diverſions of the times, eſpecially gambling; which engroſs the greateſt part of their attention, ſo that they have no time to ſpare for the good of their country, or even their own intereſt, which muſt ultimately be connected with it. Inſtead of this, it is too common for them to depopulate the country, by ſetting too large farms, and ſheep-walks; ſo that many families, whoſe progenitors have lived ſome hundreds of years in one

place,

place, are obliged, either to go to great cities, or to leave the kingdom altogether.

Every man has his hobby-horſe, to which every other thing muſt yield: But it is a great happineſs when mens minds take a turn to ſtudy their own intereſt, and the good of their country at the ſame time. It is a good motto, and always to be kept in mind:

Non nobis ſolum nati ſumus.

Which is tranſlated: "Man is not born for "himſelf."

SECTION

SECTION IV.

Why Farmers are not enriched in proportion to the increaſed Price of Proviſions.

IN ſearching for the cauſes why farmers are not enriched, in proportion to the increaſed price of proviſions, we ſhall be at little loſs to fix on ſome of thoſe methods which modern farmers have looked upon to be improvements.

It is too much the cuſtom, particularly in agriculture, for people to look only to what will produce immediate profit and advantage; without attending to the certain and obvious conſequences in future crops. Hence, in ſome places, too much is laid out in corn-crops, and too little in graſs, becauſe from thence the farmer thinks he derives immediate advantage. In other places, the ground is almoſt all laid out in graſs, becauſe there they imagine that graſs farms turn to the

greateſt profit. In others, again, the ſoil is waſted by the continual uſe of lime and marl in great quantities, becauſe theſe ſubſtances are found to produce great crops for a few years; and it is vainly hoped that the ground can continue to do ſo perpetually, without being ſown with graſs. Lime and marl are excellent for improvement, when followed with dung, and thrown into graſs; but, by conſtant cropping, exhauſt the ſoil ſo much, that it will bear but ſcanty crops of either corn or graſs. This ſhews the neceſſity of half corn and half graſs.

When cuſtoms of this kind are arrived at any conſiderable height, the natural conſequence muſt be, that the ground being unable to produce a ſufficient crop, the farmer cannot pay his rent; and this added to the avidity of ſome landholders in raiſing their rents to the utmoſt, produces numerous failures in different parts of the country. Theſe failures, again, prevent the ground from being properly improved; and thus the malady, once begun, neceſſarily increaſes, and every year the farm muſt decline.

It is evident, indeed, that no farm can be improved without expending a conſiderable

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ſum of money at firſt, and alſo incurring an annual expence to keep it in that order: And unleſs a farmer has a command of money, no improvement can be made.

It muſt alſo be remarked, that no farm can be kept in order without a part of graſs; and without money to buy cattle, the farmer cannot reap any benefit. Along with this, however, we muſt take notice, that poſſibly many farmers may truſt too much to ſervants; the conſequences of which are ſufficiently obvious.

Among the cauſes of the ſcarcity of money among farmers, we muſt not forget to enumerate the enormous load of national debt. By the accumulation of this, the greater part of the money in the kingdom has been depoſited in the hands of government; and the high intereſt given by thoſe in power, ſuperior to what is allowed to be received from any private perſon, ſtill encourages the monied men to depoſit their caſh in the hands of government, rather than in thoſe of farmers, or any private perſons. Thus the farmers being deprived of their uſual reſources, neceſſary for keeping their credit in ſome caſes, ſqueezed in too many inſtances, by

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ſome avaricious landlords, and being likewiſe allowed too ſhort tacks, become at laſt unable to pay their rents.

The general cry at preſent is, that farming is a loſing game; ſo that few people of property now chuſe to embark in it, and fewer chuſe to riſk their money by lending it to a farmer.

And perhaps, in ſome caſes, by giving into the general vice of the country, too expenſive a mode of living, it is impoſſible but many failures muſt happen; ſo that things proceeding in this manner for ſome time, the produce of the country in general muſt be affected in the moſt grievous and alarming manner.

Some farmers often hurt themſelves, partly from ignorance and ſelf-conceit, by not having a proper rotation of crops of corn and graſs: Sometimes trying experiments that turn out to their diſadvantage; many hurting themſelves during the laſt three or four years of the leaſe, by overcropping, and thus ruin the ſoil; ſo that it will perhaps take ten years to bring it into the ſame condition it was before. This is injuring the landlord, and the nation in general; and doing no good

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to the farmer, and only tends to indulge a little resentment, in order to hurt the incoming tenants.

The following quotation from Marshall's Rural Economy, may tend to illustrate the preceding observations.

P. 102. " Minute 58. January 29. In a " conversation to-day with two of the first " farmers in the county, a comparison be- " tween the present times, and those from " fifteen to twenty years ago, became the " subject.

" The price of barley was then, from five " shillings to seven shillings a coomb; of " wheat, from ten shillings to fourteen shil- " lings; and beef three shillings and sixpence " a stone. Now, barley is eight shillings, " wheat twenty-two shillings, and beef four " shillings, or four shillings and sixpence: " Yet, in those days, farmers had plenty of " money, and actually increased in riches; " whereas, now, they are moneyless, and " are every year sinking in poverty.

" To explain this paradox seemed difficult; " the price of day-labour is somewhat de- " creased; servants wages the same now as " then; house-keeping somewhat more ex-

" pensive

" penſive as to the price of its particular ar-
" ticles, but, upon the whole, it is not more
" ſo; for farmers, principal farmers, now
" keep leſs company than they did in thoſe
" times. One of them obſerved, that he
" pays the ſame price for a coat, and the
" ſame for a ſhirt, he did formerly; and as
" to market, and other perſonal expences, he
" is clear, that among capital farmers, they
" are leſs now than they were then. The
" poors-rate, it is true, falls heavy at preſent;
" but he ſays, that he pays only fourteen
" pounds now, for what he then paid ten
" pounds; this, therefore, is not of material
" conſequence: And this excellent huſband-
" man, ſenſible and well-informed as he is,
" ſeemed willing to aſſign the cauſe to ſome
" inexplicable hidden myſtery.

" At length, however, he produced an
" idea, which goes a great way towards ex-
" plaining the apparent riches of former, and
" the apparent poverty of the preſent times.

" In every corner there are monied men.
" Formerly they diffuſed their riches through
" the neighbourhood they lived in. It was
" no uncommon circumſtance for a farmer
" even to be aſked to take money; whereas

" now,

" now, through a want of private credit, and
" monied faith between man and man, and
" ſtill more to the preſent high rate of inte-
" reſt to be made on government-ſecurity,
" the monies which were diſperſed in the
" country among farmers and tradeſmen are
" now all called in.

" This explains very fully the apparent
" riches of former times, and the apparent
" poverty of the preſent; but it does not ex-
" plain why farmers formerly grew rich, but
" now grow poor.

" The late riſe of rents at once fully deve-
" loped the whole myſtery. For although
" the uſurer's money might aſſiſt the farmer
" in purchaſing ſtock, &c. to an advantage;
" yet this advantage was in great meaſure
" cancelled by the intereſt which he had an-
" nually to pay for it; whereas the money
" ariſing from the comparative lowneſs of
" rent, required neither intereſt nor even
" principal to be repaid.

" Thus, ſuppoſing farms to be raiſed thir-
" ty per cent. within the laſt fifteen or twen-
" ty years; and ſuppoſing, that among
" middling farmers, the riſe in the poors-
" rates, and the extra expence of houſe-
" keeping,

" keeping, is adequate to the advance of
" produce; the farmer, who juſt now makes
" ends meet on a farm of one hundred and
" thirty pounds a year, had formerly a ſur-
" plus of thirty pounds left in his pocket to
" buy ſtock, &c. at the beſt market.

" This, even the ſecond year of his leaſe,
" he found of great advantage; but the third
" year, the thirty became ſixty; the fourth,
" ninety, or perhaps one hundred pounds:
" For the intereſt, or a proper management
" of the money, had increaſed his ſtock; ſo
" that by intereſt upon intereſt, or by other
" advantages made of the money, a careful
" induſtrious, fortunate man found himſelf,
" at the end of his twenty-one year's leaſe,
" to be worth eight hundred or one thou-
" ſand pounds; and conſequently got, very
" deſervedly, the name of being a rich far-
" mer.

" But the caſe of the man who now takes
" a farm of a hundred and thirty pounds a
" year, is very different.

" Let us ſuppoſe him to have a capital juſt
" ſufficient to ſtock it, and help him through
" the extra expences of the firſt year.

" His crops turn out tolerably, and hav-
" ing

" ing common good luck with live ſtock, the
" neat produce of his farm, juſt clears its
" expences, buys him a new coat, and pays
" his landlord: But this done, he finds him-
" ſelf without a ſixpence left in his pocket
" for manure, or to go to a cheap market
" with.

" This however is not all. In the courſe
" of the year he loſes a cow, perhaps a horſe.
" What is to be done? He is pennyleſs, and
" cannot borrow a ſhilling in the whole
" country. Why, he muſt either do with-
" out, to the great prejudice of his farm, or
" ſell ſome other part of his ſtock to replace
" them with.

" The next year, his wheat, or his turnip
" crop fails him. He has not a ſhilling be-
" fore-hand to carry him over the difficulty;
" he conſequently becomes in arrear with
" his landlord; his ſpirits are broken; his
" land not only wants manure, but even la-
" bour and teathe; for he is glad to ſell his
" bullocks before Chriſtmas, to keep his
" landlord in temper. The conſequence
" need not be traced.

" Thus it appears, that the poverty of
" preſent farmers, more particularly of

" middling and ſmall farmers, reſults, in " ſome meaſure, from an advance in the ex- " penſes of houſe-keeping, and an advance " in the pariſh rates; but principally, from " the preſent ſcarcity of money, and from " the late riſe of rents."

Theſe reaſons may be very juſt: But another cauſe muſt alſo be aſſigned for the preſent poverty of the farmers. The produce of Norfolk is on the decline. We have already cited Mr Marſhall himſelf, as an evidence of this; and have proved, that the diminution of the produce is owing to their following an improper mode of cultivation.

It may alſo be added, That lands newly taken from ſheep-walks, and new marled, which was the caſe in ſome parts of Norfolk twenty years ago, will, for a few years at firſt, produce more than they will do afterwards; eſpecially if not ſown with graſs ſeeds, and allowed to lie for ſome years. Light ſoils, ſuch as the moſt of this county is, may be much hurt, if not entirely ruined, by being kept conſtantly in corn.

I am alſo clearly of opinion, that turnips, if not eaten where they grow, are an exhauſting crop. Now, as great quantities of turnips

nips are ſown there, and very little graſs, the country muſt gradually be ruined. And if its improvement ſhould hereafter be attempted, it will be more difficult and expenſive to bring it into good order than it was at firſt. My opinion on this ſubject is confirmed by Mr Batchelor. Vide Marſhall,

P. 273. " Minute 118. Mr Batchelor of " Bradſtone, (a ſenſible intelligent farmer, " at whoſe houſe I ſlept), ſays, that twenty " or thirty years ago, he never could get " ſtock enough for his turnips. He has fi- " niſhed forty or fifty bullocks in a year; " now he does not know how to buy few e- " nough, and does not finiſh more than " twenty or thirty: The roots do not come " to any ſize, and have no " tack" or proof " in them."

Mr Marſhall alſo obſerves, vol. 1. p. 7. That ſome gentlemen now will grant only a ſeven year's leaſe; which muſt prevent any new improvement, and conſequently, ruin the ſoil, and diminiſh the produce.

Beſides theſe cauſes already enumerated, there are, however, others by which agriculture is either directly or indirectly injured. It is not, at firſt view, eaſy to conceive how much

much the increaſe of cities and great towns affects farming; but this evidently leaves the country in a manner totally deſtitute of gentlemen: Hence the ſervants wages, at leaſt in Scotland, is increaſed double of what they were thirty years paſt; and the price of every article the farmer has to purchaſe is alſo increaſed; the country is deprived of that ſhare of the circulation of caſh which it ought to have; and the evil is particularly increaſed by that intolerable rage for building, which has ſo long prevailed. Thus the caſh is made chiefly to circulate among people uſeleſs in a great meaſure to agriculture; for great quantities of money are ſent into foreign countries for wood and iron, which are eſtimated by builders to be near two-thirds of the expence of a houſe. Or if the landholder ſhould not give into the common madneſs of the times, by building a large houſe, he will depoſit his money in the hands of a trader, manufacturer, or any where, rather than in thoſe of a farmer; and other perſons of inferior rank never fail to manifeſt the ſame diſpoſitions.

Another cauſe why farmers do not grow rich, is owing to ſome taking large farms

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too dear, in an unimproved ſtate, and for which they have not a ſufficient capital to manure and improve.

By theſe means they are ever pinched for money, and conſtantly hurried with the ploughing, not having ſufficient ſtrength of cattle to labour the farm in the proper ſeaſon. This, for the moſt part, makes the time of ſowing very late, and the proper ſeaſon is often miſſed: Of courſe, the time of reaping becomes late alſo. Hence they often loſe a great part of the crop; as, by being ſo late, it is frequently ſhaken, and broken with the winds, and hurt by early froſts.

It is in general the caſe with moſt farmers in Scotland, and ſome parts of England, that they ſow too late in the ſeaſon. It would be much for their intereſt to ſow early, whenever the ſeaſon will permit, and likewiſe to ſow all early corns wherever the ſoil is rich.

It would be much for the intereſt of many farmers, that their farms were only the one half number of acres; or at leaſt, that they would only ſow the one half of their farm: For they would find it more for their profit to have one acre properly ploughed, and ſown

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in ſeaſon, and ſufficiently manured, than three or four acres in the way they often take.

Whenever a farmer is in ſuch a ſituation, as that his farm maſters him, being obliged to plough at all ſeaſons wet and dry, in order to ſow what he intends, he muſt be ſure to loſe. When the ground is wet, it would be for his intereſt that his men and horſes were idle. For wet ploughing and ſowing, even where the ground is rich and in good order, hurts it very much; and ſome places will not yield half the crop of the ground ploughed dry. This is not adverted to by the generality of farmers as it ought to be. Wherever wet ploughing and late ſowing is practiſed, it may juſtly be ſaid to be one cauſe why they do not make rich, which is too much the caſe with moſt farmers. Every year's experience ſhews this.

SECTION V.

What is the reason that provisions are so high, and seem to be every year increasing in price, notwithstanding so many great improvements said to be made in agriculture in Britain?

ONE very great cause of the dearness of provisions is importation; nor can cheapness be expected while such a practice is continued.

The farm produces in proportion to the expence laid out for improvements, manure, &c. But if the means of improvement be taken away from the farmer, by sending the money out of our own country into others, how can he improve?

Exportation must always be a principal cause of cheapness, because it brings in large sums to the farmer, which enable him to purchase sufficient quantities of manure, and likewise

likewiſe to keep a large ſtock of cattle, not only for labour, but for fattening.

The Turks at one time prohibited exportation; the conſequence of which was, that a famine took place a few years after, in which many thouſands periſhed.

Add to this, that when corns are imported, the freight, the merchant's profit, and land carriage, often amount to more than the original value of the commodity.

The great advantages reſulting from the exportation of grain have long been known. Government formerly endeavoured to encourage it; and while the execution of the plan was not obſtructed by the folly of thoſe chiefly concerned, the conſequences were, that the nation enjoyed plenty of proviſions, and at a low price. But unhappily, the avarice of the farmers, merchants, and landholders, with ſome other concurring circumſtances, fruſtrated the intentions of government. I cannot explain this matter better, than is done by Mr Donaldſon. Vide Letters, p. 86.

" Whoever ſuggeſted giving a bounty on " the exportation of corn, was a true friend " to his country. But I am afraid moſt of

" thoſe

" thoſe who concurred in the motion, had
" not the ſame patriotic ſpirit. They did
" not behold it in that extenſive, generous
" view, which opened upon the mind of the
" perſon who propoſed it. I mention my
" apprehenſion with more confidence, ſince
" that meaſure, ſo obviouſly calculated for
" the public good, proved in the end injuri-
" ous to it. The firſt agitation of this poli-
" tical catholicon, gave a jog to the ruling
" powers of agriculture, and cultivation be-
" gan to move with alacrity; vaſt abund-
" ance of all kinds of grain flowed in upon
" the markets; malt was exported to Hol-
" land in prodigious quantities; Engliſh
" wheat drove famine from every country;
" and notwithſtanding the drain was opened,
" ſtill the face of plenty was ſeen ſmiling in
" every corner of the kingdom. Our neigh-
" bours the French, having ſo ample a mar-
" ket to be ſupplied from, threw every atten-
" tion upon the vine-yards and manufacto-
" ries; and had public virtue flouriſhed in
" England, we ſhould, to this day, have
" been the corn-factors and clothiers of Eu-
" rope; while France, not feeling the throbs

" of neceſſity, would have dozed on in the
" ſame lifeleſs purſuits. We have let go the
" opportunity, and I am afraid we ſhall find
" this axiom true: It is eaſier to prevent a
" miſchief than repair it. This was too
" great a bleſſing for an Engliſhman to be
" ſatisfied long with. The farmer, tempted
" by avarice, advanced the price of grain
" above the ratio of the demands for the dif-
" ferent ſorts of it; the factor, unwilling
" that induſtry ſhould run away with all the
" advantage the times ſo favourably offered,
" ſet a profit upon the farmer's advance;
" theſe people growing ſo ſuddenly into
" wealth, alarmed the jealouſy of the land-
" holders; and they, to be upon a par with
" both, augmented their rents. This was
" the firſt ſhock. When ſoon after, the
" commiſſaries, contractors, and paymaſ-
" ters, from the North and Weſt, together
" with the mighty plunderers of the Eaſt,
" guſhing into England with a confluence of
" wealth, compleated the ruin of this ſalu-
" tary ſcheme."

Another cauſe of the increaſing price of
proviſions, is the vaſt numbers of monopo-

polies

polies of all kinds of proviſions. A multitude of people make it their only buſineſs to buy up proviſions; ſo that many articles may be ſaid, without much exaggeration, to be ſold twenty times over before the conſumers can buy them; and, unhappily, the number of people thus employed ſeems ſtill to increaſe.

In the article of butcher meat, for inſtance, how many are employed in going from market to market, or fair to fair, buying in one market or fair, and ſelling in another; taking ſometimes a profit of twenty ſhillings on a cow or ſmall ox: And thus the price at laſt is raiſed ſo high to the farmer who fattens the cattle, that he frequently loſes all his graſs, or, in other words, has nothing to pay his graſs rent: Whereas, were the perſons who rear the cattle to ſell them again immediately to the grazier, the profit would be divided betwixt the rearer of cattle, the feeder, and conſumer; but now it very often happens, that the rearer and feeder of cattle have no profit worth while, but rather loſs, and the intermediate dealers run away with all the profit, at the ſame time that the price is raiſed very high to the conſumer.

Were

Were none allowed to deal in cattle but thoſe who had either graſs, or other provender to fatten them with, the profit would be divided betwixt the rearer, feeder, and conſumer.

When cattle are ſelling high, how many thouſands are employed in this *couping*, or dealing in cattle? And how often do we ſee a farmer's ſervant, as ſoon as he has been able to ſave twenty pounds, ſet up for himſelf, and commence dealer in cattle, going from fair to fair in queſt of gain? This may very properly be called the ſchool of vice. Here they learn to lie, curſe and ſwear, drink, cheat, &c. Some new laws would perhaps be requiſite, in order to keep theſe people within due bounds; or, if the preſent laws againſt foreſtalling and regrating were ſtrictly put in execution, perhaps they might be found ſufficient.

How many are there who make a monopoly of ſome kinds of fiſh; and rather than ſell them at a ſmall profit at home, ſend them to London? To keep up the market, throw them into the river Thames, when the price is low? But it is evident, that wherever fiſh

are

are caught, the inhabitants ought firſt to be ſerved at a reaſonable rate, before any exportation takes place.

Whenever there is the ſmalleſt appearance of a ſcarcity of corn, large quantities are bought, and kept up until the price riſes. Too many every where make it a principal part of their buſineſs, to retail corns grinded into meal: But were the farmer only to ſell his corns in the market, the price would be cheaper to the conſumer, and the farmer would likewiſe, for the moſt part, be a greater gainer, by having the price of the market without any deduction, except the expences of ſelling.

How often is advantage taken of the farmer's neceſſity, when obliged to ſell for ready money, at the ſame time that this does not reduce the price to the conſumer? But if all articles were ſold in a public market, either the farmer, or the conſumer has the advantage.

Butter and cheeſe are other articles of monopoly, and often come through many hands before they reach the conſumer; as well as all kinds of poultry, eggs not excepted.

The

The baker's profits on loaf-bread are limited by act of parliament; and why may not the butcher's, and that of thoſe who either buy or import corns to be made into meal? How often do we ſee thoſe who import corns, in time of ſcarcity, buy up in one part of the country what they ſhip off to another; by which means the price is ſometimes raiſed very high. Nay, ſometimes thoſe very corns, or others of the ſame kind, are returned at an advanced price to the place from whence they were originally ſhipped; and thus an artificial dearth is raiſed, as was ſeen in the year 1756. At that time, thoſe who dealt in meal in the North of Scotland, refuſed 15s. per boll, for that of the crop of 1756; yet a great part of that very meal was afterwards ſold in 1757, for 5s. per boll; ſome of it ſo much damaged by keeping, and the oatmeal mixed with bear, that they were obliged to throw it on the dunghill.

This ſhews, that whenever the corn crop is greater than the conſumpt, it is beyond the power of any ſet of people, whether gentlemen, merchants, or farmers, to combine together in ſuch a manner as to raiſe the price

price of grain too high, above one year. But whenever the corn crop is ſo ſcanty, as to be able only to ſupply the preſent demand, then the merchant, by ſhipping it from one port to another, may raiſe the price very high; and the more ſo, when a very large quantity is bought up until the prices riſe: And thus a number of rich merchants, by combining together, may cauſe an artificial dearth for ſome time.

Another reaſon of the increaſed price of proviſions is, The great increaſe of money, particularly paper currency.

Beſides the money in the hands of noblemen, gentlemen, merchants, and manufacturers, the bank and bankers of England, and thoſe of Scotland, deal annually to an immenſe ſum, producing an artificial circulation, greatly above the real wealth of the inhabitants. This money is moſtly given to merchants and manufacturers; a very ſmall part being laid out on improvement of farms, which of itſelf is enough to raiſe the price of proviſions. The effect of this fictitious wealth is, that luxury has arrived at a very high pitch, and all ranks of people live in a more expenſive manner than formerly.

The

The fashionable custom of noblemen, gentlemen, merchants, and even tradesmen having so much of the best ground in Britain laid out for pleasure, in grass and shrubbery, also contributes to raise the price of provisions.

This neither brings profit to themselves, nor any advantage to the nation; but instead of that, is considerably expensive in keeping it clean. The quantity of ground laid out this way in Britain is very considerable; most of which in former years was wont to produce good crops of corn: And this, with the number of acres laid down in grass, and never broke up, must of course very much diminish the produce of the nation.

The Romans were very frugal of their soil at first, when a single acre was found sufficient to maintain a whole family. But when Rome came to its grandeur, luxury increased, and great numbers came also to have their villas and pleasure grounds; and this obliged them to fetch their provisions from different quarters of the globe, which in the end occasioned their ruin. Any person may see, that when provisions are brought from foreign countries, the expence must be very

great

great, and the mother country will be neglected, and of courſe go to ruin.

Another cauſe of the dearneſs of proviſions may be, the want of a regular rotation of crops of corn and graſs, with a fallow.

Thus many farms are conſtantly on the decline, by continual cropping with corn without graſs. In other places, too much graſs, and too little corn, has the ſame effect of diminiſhing the due quantity of national produce.

The attempts of many to improve new ſoil, and giving it over before it is half finiſhed, do the ſame; though this laſt may be owing in ſome meaſure to want of money, knowledge, or patience.

To all which we may add, the many failures of farmers in different places, owing to the land being too high rented in its unimproved ſtate, as well as other cauſes. And we may lay it down as an indiſputable maxim, That when a farmer fails, the produce of the farm is as certainly at that time on the decline.

The very great increaſe of cities and large towns, as it may be conſidered as one of the principal cauſes of the decline of agriculture,

ſo it undoubtedly is a very great cauſe of the increaſe in the price of proviſions.

Let us conſider only how many idle horſes, dogs, cats, rats, &c. &c. are maintained in conſequence of the augmentation of theſe cities; at the ſame time, that horſes in cities are maintained at three times the expence of thoſe employed in cultivating the ground in the country: And it may be truly ſaid, that within theſe few years, the conſumpt of corn and hay for horſes, has increaſed twenty times what it was formerly. This is certainly a great encouragement to farming; but is mentioned here only as one of the cauſes of the dearneſs of proviſions.

The general fact, that a great proportion of land is employed in raiſing the food of horſes, is obvious to every one. Yet few, perhaps, would ſuppoſe, that the maintenance of a horſe is four times as great as that of a man.

The following account, which I received ſome years ago from a nobleman's ſteward in Scotland, will throw conſiderable light on this ſubject. The whole of the bread and beer uſed in this nobleman's family, was baked and brewed in the houſe. Forty bolls of

of wheat and forty bolls of malt ſerved the whole family a year. But the reader will perhaps be aſtoniſhed to learn, as I confeſs I was, at firſt hearing it, that the family horſes, and thoſe of viſitors, conſumed above three hundred bolls of oats per annum. Nor did the nobleman keep a large ſtud. The perſons of the family who ate daily in the houſe were more numerous than the horſes; beſides which, a conſiderable number of workmen and poor people were daily ſupplied with bread and drink.

In reflecting afterwards upon the above relation, I was fully convinced of its truth; for it may eaſily be proved, that all carriage horſes coſt their owners as much as would maintain four ploughmen at leaſt, according to the manner in which labouring people live in Scotland. Each horſe will eat a peck of oats per day, beſides hay. Now, I gave my ploughmen two pecks of meal per week, and a Scots pint of milk each day, or ſix pence a week. Nor was this an inſufficient allowance: For although the men had nothing to live on but the meal and milk, and perhaps did not eat a pound of fleſh or fiſh in a year, yet they looked well, and were fully capable

of

of performing their labour. Nay, they commonly ſaved a part of their meal, which they ſold.

Again, allowing four feeds per day to a horſe, the amount in a year is twenty-two bolls, thirteen pecks. This is the whole produce of four acres of good ground, at five and a half bolls, or four quarters for each acre; and which is much more than the average of any county.

To this muſt be added, at leaſt one ſtone of hay per day, for each horſe; which is the product of two acres, at one hundred and eighty-two ſtone, or one ton and three-fourths for each acre, and which is about the general average of hay crops in good ſeaſons.

I have known my plow-horſes eat two ſtone of hay, and two feeds of oats per day; ſo that, in fact, the keeping of farm horſes, when fed with corn and hay, is as expenſive as that of carriage horſes.

From the preceding calculation it appears, that to ſupport a carriage horſe, the produce of ſix acres of good ground is required. This extent of land, even by the common mode of cultivation, will maintain four men; but if laboured with the ſpade would ſupport twelve.

Now,

Now, as the population of any country can only increaſe in proportion to the means of ſubſiſtence which it poſſeſſes, it evidently appears, that to multiply the breed of horſes, is to deſtroy the human race; and, that whoever keeps an unneceſſary horſe, is ſacrificing four of his own ſpecies upon the altar of vanity.

The vaſt quantities of grain uſed in diſtillation cannot but be thought to affect the price of proviſions very conſiderably.

The quantity of grain diſtilled in Scotland in 1787, is aſſerted to have been almoſt equal to the whole that was produced in the country; and as it may be juſtly ſaid, that one third of all the barley in Britain is diſtilled, we cannot avoid perceiving how much the price of every kind of proviſion muſt thereby be augmented: eſpecially, when to this is added, the very advanced price of ploughing, both with regard to men and cattle; the oxen being every where laid aſide, and horſes, much more expenſive animals, uſed in their ſtead. It is likewiſe obvious, that the cuſtom of diſuſing oxen for the plough muſt have a conſiderable effect in augmenting the price of butchers meat.

That

That the price of butcher meat is confiderably advanced, both by the caufe juft now mentioned, and by the unneceffary increafe of carriage and riding horfes, is fupported by the following obfervations of Mr Donaldfon. Vid. Letters, p. 143.

" It has been a puzzling propofition to " many, why the price of butcher's meat " fhould advance with the price of bread. " For, fay they, if the high price of bread " proceeds from a lefs quantity of corn being " fown, butchers meat would neceffarily fall, " from the arable land being laid down with " feeds for the maintenance of cattle. But " when they confider the unthrifty breed of " horfes, fo neceffary to furnifh the multi- " plicity of poft chaifes, the mifchievous in- " creafe of ftage coaches, the extravagant " number of private ones, the vanity of " young men of fortune, who muft have " their ftud, the impudence of young men of " no fortune, who will have their gelding, to- " gether with demands from abroad, the dif- " ficulty of refolving the caufe muft vanifh; " as they clearly fee, that the paftures which " formerly fed fuch herds of beafts, and " flocks of fheep, are now appropriated for

" the

" the run of brood mares, and colts; and
" that the quantity of oats ſo neceſſary to
" ſupply the conſumption of this monſtrous
" increaſe of horſes, interferes with the
" growth of other grain allotted for the con-
" ſumption of men.

" Subſtituting horſes for ſteers in plough-
" ing and waining, is a material loſs to the
" public in the article of meat; for it is well
" known, oxen ſpread, and increaſe conſide-
" rably in weight, from labour; beſides,
" they get into fleſh with more eaſe, and leſs
" expence, by feeding kinder."

Idleneſs is a principal reaſon, why the prices of proviſions are every year increaſing.

A ſlothful man is brother to the waſter.

Man is naturally active and reſtleſs; and when he is not uſefully employed, he rarely avoids the doing of hurt to himſelf, or miſchief to others.

Idleneſs teems with vice, and brings forth diſtreſs and miſery, which are the unavoidable and certain effects of vice; whereas wealth and numbers, the chief ſtrength and happineſs of a nation, are increaſed by induſtry.

Idle ſubjects are poor and indigent, and

muſt

muſt be maintained at the expence of others, either by a baſe and ſervile dependence, or by theft, robbery, or begging.

It is eaſy to perceive, what effects idleneſs produces in the minds of perſons of all ranks; but the happineſs of individuals, as well as that of a nation, depends upon a diligent application to buſineſs.

Perſons of all ranks employ too much time on expenſive pleaſures, or fruitleſs and unprofitable diverſions. The management of private affairs is neglected; and through heedleſs inattention, and want of oeconomy, many perſons of eaſy fortunes are brought into difficulties, and reduced to low condition.

The increaſing number of public diverſions and amuſements not only waſte much time, but the expence attending them is very great; ſo that numbers neglect their own intereſt by throwing away that money which ought to maintain their families, to encourage a profligate and diſſipated ſet of men, that are hurtful to ſociety, and who corrupt the morals of youth.

In all public diverſions which call out a conſiderable number of people, ſuch as horſe-

races,

races, &c. the loſs ſuſtained to the public may be perhaps ſeveral thouſand pounds each day. Now, although nature furniſhes us abundantly with materials, yet our own induſtry and labour is required to fit them for our uſe; and whoever labours not for his own bread, muſt eat the bread of others, and thereby unjuſtly invades his neighbour's property.

In fine, idleneſs prevents great men from adverting to their own intereſt, truſting the management of their concerns to others; whereby their annual expences are greatly increaſed, their eſtates neglected, and little improvements made; which if they perſonally attended to, might in a ſhort time, be ſo improved, as to produce above double the preſent crops. Whereas many eſtates, inſtead of being improved, are neglected, and ſuffered to go to ruin; every year turning worſe and worſe.

The lower claſs of people never fail to imitate the example of their ſuperiors. By contracting a habit of idleneſs, they not only ſpend treble the ſum which they would do, (perhaps as much in one day as they can earn in ten), when employed in ſome uſeful buſi-

nefs, particularly in agriculture; but the lofs which the public fuftains muft be very great, as it tends fo much to increafe the price of provifions.

The inhabitants of any country, when profitably employed, are its greateft ftrength and wealth; but when idle, its greateft weaknefs and caufe of poverty.

Whenever the ground is neglected to be properly laboured, not producing a fufficiency to fupply the demand of the inhabitants, the prices of provifions, of courfe, muft rife; whereas, were the generality of farmers to double their diligence, or employ a greater number of hands, the prices would foon be reduced.

It is owing to indolence and inactivity, that many farms are, in place of being improved, left to go to ruin. The fame indolent fpirit in many farmers, prevents them from improving their wafte grounds.

Idlenefs of all ranks of perfons in every profeffion, is a great hurt to the public in general. The labour of mankind may be compared to a treafure daily taken out of the bowels of the earth; and, when neglected,

every

every day's labour is loſt, and cannot be recalled.

Moſt of the particulars ſtated in the fourth ſection, and given as reaſons why the farmers do not make rich, may, with equal propriety, be adduced as reaſons why the prices of proviſions are conſtantly on the increaſe, And, that the reader may be the more fully enabled to keep this in his eye, we ſhall here recapitulate, in few words, the general cauſes already aſſigned for both; and theſe ſhall now be arranged, though in a manner ſomewhat different from the order in which they occur in the eſſays, according to the importance of the cauſes themſelves, and as they may be thought to have more or leſs influence in producing the general effect.

1. Importation, and conſequently no exportation.

2. The want of a regular ſyſtem of corn and graſs, with a fallow.

3. The rents of the farms being too high in their unimproved ſtate.

4. Too ſhort tacks or leaſes, which prevent any improvement being made on the farm.

5. The general run of farmers having too much

much land for their ſtock, and too much in tillage.

6. The univerſal ſcarcity of money among farmers, and their want of credit, which prevents them from making the neceſſary improvements.

7. The univerſal diſuſe of oxen in ploughing, and the introducing of horſes in their ſtead.

8. The improper uſe of lime and marl, by taking too many crops before ſowing into graſs, which exhauſts the ſoil, in many places to a *caput mortuum.*

9. Plowing when the farm is wet, which raiſes but a poor crop, although the ſoil be rich.

10. The general practice of farmers ſowing too late in the ſeaſon, which makes a late harveſt, of courſe precarious, and often bad crops.

11. The great number of monopolies of all kinds of proviſions.

12. The great increaſe of money, particularly paper currency, and the vaſt ſums brought home by thoſe who make fortunes in the Eaſt and Weſt Indies.

13. The

13. The vaſt quantities of grain uſed in diſtillation.

14. The very great increaſe of cities and large towns.

15. The great number of farmers failing in moſt parts of the country.

16. Laſtly, Idleneſs is a principal cauſe that the price of proviſions is every year increaſing.

From a conſideration of all theſe particulars, it muſt be evident how much it is the intereſt of the inhabitants of Great Britain, not only to improve thoſe grounds which are already cultivated, but likewiſe to cultivate thoſe which are now lying waſte.

The crops for ſeveral years paſt have been but indifferent, owing to the bad ſeaſons. If we were better ourſelves, the ſeaſons would be better alſo. It is the farmer's buſineſs to uſe every lawful mean to improve his farm; but after all he can do, it depends entirely upon the pleaſure of the Almighty Sovereign of the univerſe in favouring us with fruitful ſeaſons; as,

" Except the Lord do build the houſe,
" The builders loſe their pain;
" Except the Lord the city keep,
" The watchmen watch in vain.

SECTION

SECTION VI.

What are the most probable means of reducing the price of provisions, so as to serve all traders and manufacturers at a much cheaper rate than at present, and likewise to be able to export great quantities annually?

FROM the foregoing view of the state of British agriculture, it is impossible to doubt, that the produce of this island, whatever we may estimate it at present, might, in less than forty years, be encreased to more than ten times its present value.

Let any person, in the least conversant with the present state of the country, consider how very small a part is improved in proportion to what is capable of being so, and he must instantly assent to the following proposition, which, in the course of conversation, I have often asserted, viz. That the produce of Britain

tain might eaſily be increaſed to the value of 1000 millions annually.

This aſſertion has been thought altogether incredible, and beyond bounds extravagant. Nevertheleſs, when I have aſked, how much the proportion of the ground in Britain really improved bore to that which was capable of improvement? it has been as conſtantly acknowledged, that the proportion of the former was not one to 100 of the latter. This, however, is granting me ten times more than I aſk; but, at the ſame time, it ſhews, how much people are convinced in their own minds of the truth of what is already publiſhed to the world in the Eſſays on National Improvements.

Nor can it in the leaſt be doubted, that whoever conſiders the means pointed out in thoſe eſſays, will find them fully adequate to the end propoſed. But it is too much the caſe with mankind, to overlook thoſe things which are eaſy and within their reach, for others more difficult, or perhaps impoſſible to be attained.

According to the calculations we make of the Britiſh produce in its preſent ſtate, the value

value of the improvements will be more or more or leſs. If we ſuppoſe it only 100 millions annually, the value muſt be 1000 millions, when thus encreaſed; or, if we ſuppoſe it 200 millions at preſent, it is eaſy to ſee, that 2000 millions a-year muſt ſoon ariſe from the methods of improvement propoſed.

The immenſity of the ſum is no argument againſt the poſſibility of raiſing it. For when we endeavour to augment the produce of the earth, it is no wonder that we ſhould be aſtoniſhed at the bounty with which our labour is rewarded by the Author of nature.

Suppoſing then, the produce of Britain at preſent to be only one hundred millions, and the conſequent improvements to be a thouſand; is not this an object of great national concern, now when providence has favoured us with peace? And ought we not then to exert ourſelves, every one in his ſtation, to promote this great end? which, if once accompliſhed, would not only exceed all the profits ariſing from trade, manufactures, and fiſheries, as well as all the improvements that could be reaſonably ſuppoſed to be made in them; but, inſtead of hurting theſe favourite

 purſuits

purſuits of the nation, would tend greatly to encreaſe them?

With a great number of people importation is a favourite object; but whoever theſe are, we do not heſitate in pronouncing them to be enemies to their country. What neceſſity is there for importation at all, excepting in extraordinary caſes? If Britain had her dependence entirely on importation, ſuppoſing a famine or ſcarcity to ariſe in the neighbouring kingdoms, and it happens to be ſo this very year, 1787; or which is often the caſe, our fleets to be detained by contrary winds, perhaps a month or two, or a great part of them ſhipwrecked; or, in time of war, when grain could with difficulty be brought home, what a deplorable ſituation muſt the nation be in. The very freight and the land carriage to different parts of the kingdom, and the merchants profits, would undoubtedly be equal, in many places, to the original coſt of the corns.

Why may not our own country be improved to ſuch a degree, as to ſuperſede any occaſion for importing the neceſſaries of life? So far is this from being a difficult matter, that it might evidently be accompliſhed with the

the greateſt eaſe. Not only might importation be rendered unneceſſary, but great quantities might be exported to other countries.

Let government, or private individuals, take only the 500,000 pounds annually expended on the importation of grain, and lay out that ſum for manure, and for improving the ſoil, the point would be gained in a year or two. How ridiculous is it then in government to give ſo many hundred thouſand pounds for the improvement of foreign colonies, nay, for the improvements in agriculture in foreign countries which we refuſe to beſtow on our own?

Every one will agree, that cheap proviſions is much for the intereſt of manufacturers and traders. But it is certain, that the price of proviſions can never be reduced by importation: Nay, by this means, we not only buy corn at a much dearer rate than it could be raiſed in our own country, but along with it, are in danger of importing diſeaſes; which was particularly the caſe in 1782, when more than a million of pounds were given for corns imported. This million and near a half, as was ſaid, together with the *L.* 600,000 formerly drawn for corns exported,

ed, made the difference of above two millions to Britain; much of which was ſaid to be of ſuch a bad quality, that thoſe who uſed it fell into lingering diſeaſes. Such alſo was the wretched ſtate of the country at that time, that had not peace been concluded, a famine muſt have enſued, and a great number in all probability would have periſhed with hunger.

Let us conſider, then, what would have been the conſequence of employing this ſum in a proper manner for the improvement of the ground. We muſt, then, in ordinary ſeaſons have had a very conſiderable quantity to export, and, in all probability, the bad crop of 1782 would ſcarce have been felt. Nor would this have been hurting manufactures in the leaſt. The manufacturers are hurting themſelves by encouraging importation; for it is taking away the very means of improvement, as we know the ground produces in proportion to the manure laid on. But the obvious conſequences of the increaſing price of proviſions, if not remedied in time, muſt be, that our manufacturers will not be able to ſell their goods on the

ſame

ſame terms with thoſe of other nations; and hence the trade muſt be turned out of its natural channel: And when once this happens to be the caſe, it will undoubtedly, like the courſe of a river, be a matter of no little difficulty to turn it back again, or perhaps it may never return again to its old courſe.

The following is a very remarkable inſtance of trade ſhifting from one nation to another. Vide Intereſt of Scotland conſidered, p. 77.

" The wool of all the growths of Europe
" was, for many ages, bought up and ma-
" nufactured by the inhabitants of the Ne-
" therlands, by whom Europe was ſerved
" with woolen goods. The woolen trade
" was firſt ſet on foot in England in the
" reign of Edward III. but it made ſmall
" progreſs until the time of Philip II. of
" Spain, whoſe yoke became very heavy and
" ſevere. While his ſubjects groaned under
" oppreſſion and tyranny, England had the
" happineſs to be governed by the wiſeſt ad-
" miniſtration ever nation was bleſt with.
" Numbers of wealthy merchants and ma-
" nufacturers fled to England; and it is
" computed,

" computed, that 100,000 families came o-
" ver and ſettled in it at that time. Here
" they were kindly received and encourag-
" ed. The trade of Europe ſhifted its abode
" with the dealers; and the woolen manu-
" facture of England was by theſe means,
" and the aid of public encouragement, car-
" ried on, and ſoon brought to perfection.
" They now manufacture not only their own
" wool, but alſo that of Spain, and the beſt
" growths of other countries, and may, in
" a great meaſure, be juſtly called the maſ-
" ters of the woolen trade. The Nether-
" landers were maſters of the linen as well
" as the woolen trade; and during theſe ci-
" vil wars, ſeveral of their linen manufac-
" turers alſo ſettled in Britain: And in the
" old burghs, the weavers ſtill go under the
" denomination of *Brabanders*, from the maſ-
" ters who taught them the art."

The beſt, indeed, the only method of reducing the price of proviſions, is by eſtabliſhing an uniform and univerſal ſyſtem of agriculture, and giving encouragement to the farmer.

The farmer cannot raiſe large crops, unleſs

leſs he has a command of money to improve his land. But if, inſtead of furniſhing him with this ſo neceſſary article, every method is taken to diſtreſs him, by the landlord raiſing his rent in the unimproved ſtate of his lands, as well as by the conſumer, the conſequence muſt very ſoon be, that the crop will be conſtantly on the decline; and every ſucceeding year will be worſe than the former; and hence, proviſions, inſtead of being reduced, will ſtill increaſe in price.

It is, indeed, a certain fact, that when a farmer is not making rich by his farm, nor going on with any improvements; when he becomes daily more and more ſtraitened; the farm commonly turns worſe every year, even though we ſhould take as the example the beſt farm in the country.

If it be conſtantly kept in corn crops, without a ſufficient quantity of manure, and a due proportion laid out in graſs, it will, in a few years become very poor; whereas, on the contrary, by a proper rotation of crops of corn and graſs, with a fallow, the ſoil would be enriching every year, and the produce increaſed.

There

There are, besides, many millions of acres lying waste in commons, muirs, mosses, and morasses, all of which might be improved, and rendered capable of producing either corns or grass, or both, by methods properly adapted to the nature of each. Nor is the quantity of ground at all inconsiderable that might be gained from the sea, or by banking in large rivers, and draining lochs. Very considerable quantities of the best soil in the kingdom are also at present lying in grass, seldom or never broke up; and which we cannot but suppose would produce very large crops by proper culture and management. The quantity of the best soil daily thrown into grass in this manner considerably exceeds what is taken in from the waste grounds, which must, in the same proportion, diminish the corn crops.

Were a number of small villages erected upon every estate, agreeable to the plan proposed of feus, or long leases, every tenant building his own house, (Vide, Plan of villages at the end of this work), it would partly contribute to reduce the price of provisions, and lessen the number of horses. For

one

one man, by adhering to this plan of a regular rotation of crops, having the one half, or two thirds in grafs, could labour with the fpade ten or fifteen acres each year, and would only need to hire a horfe to harrow, carry home the crop, and drive out the dung, The produce would be much more after the fpade than after the plough, and cheaper: For when a farmer has only ten or twenty acres cultivated in the prefent method, the expence for men and horfes will almoft equal the value of the whole produce; fo that thofe who have only a few acres, are kept conftantly poor, and the farm alfo.

Many of the fmall farmers are in a worfe fituation than the day labourers: Whereas, if the villages were properly planned out at firft, each houfe having two and a half acres at leaft, fome five or ten, the feuars might live comfortably, and have many articles, the produce of the farm-garden, to fell.

It is commonly obferved, that fmall tenants fell more poultry and eggs than great farmers.

It may be faid, in proportion as the number of villages multiply, the price of provi-

 fions

ſions would decreaſe, and population increaſe. Indeed, the number cannot be too many, if upon a proper plan.

It would be for the intereſt of many gentlemen, that half or the whole of their eſtates were fewed out, or let upon long leaſes, according to Lord Gardenſtone's plan, for one hundred years, and renewed at the expiration of that term, upon paying two years rent.

It is amazing what effect this would have upon mens minds; how much their induſtry would be quickened when they reflected that all their improvements would continue with their families for ages.

There is no ſcheme that ever was yet invented, which will tend to reduce the price of proviſions ſo rapidly, as giving a ſmall portion to every perſon, nearly in equal proportion to their ſtock.

This is demonſtrated from the practice of the Romans. When their commonwealth was firſt erected, they enacted a law that no perſon ſhould have above one acre. Sometime afterwards, that every one ſhould have two acres; a number of years after, four

acres;

acres; and at length, ſeven acres to every citizen without diſtinction.

Cincinnatus, although ſo diſtinguiſhed a character as to be choſen dictator had only ſeven; and when Rome was in its greateſt grandeur, no perſon was allowed to purchaſe above five hundred jugera.

It is very remarkable, that about Cato's time, and 150 years after, the wheat was ſold only from three ſhillings and ſixpence to ten ſhillings per quarter.

In the firſt ages of the empire, the lands were all cultivated by the ſpade; and many of their generals cultivated their farms with their own hands. It is ſaid, afterwards, the ſlaves cultivated their lands, and of that kind too that had been ſtigmatized with marks of infamy for their crimes.

To adopt the above-mentioned ſcheme of villages, would only be to imitate the antient practice of the Romans; which they found, from the experience of many ages, to tend greatly to the advantage of the commonwealth, and would at this day be equally beneficial to us.

By comparing the crop raiſed upon each acre, after being laboured with the ſpade, with

with the crops produced after the plough culture, would at once prove which was moſt for the general intereſt of the nation and individuals; as it is propoſed, the ſame rotation of crops ſhould take place after the ſpade as after the plough.

Many new diſcoveries might be made, by making different trials in the drill way, which would employ a whole family, young and old, boys and girls; and this would teach them the rudiments of farming. The ſeed which would be ſaved by the drilling, and the profits ariſing from the extraordinary produce, would do more than pay all the expence of labour.

The price of proviſions would be much reduced, if many large farms were divided into ſmall ones.

There ought to be a great number of ſmall farms of two horſe or oxen ploughs, few of them leſs than forty or fifty acres, and thoſe which were leſs to be laboured with the ſpade. And perhaps few ſhould be allowed more than three or four ploughs.

Many gentlemen that poſſeſs large tracts of land, would find it to be their intereſt to give the one half of it for nothing to any perſon,

who

who would engage to improve the other half. They would ſtill be great gainers; for one acre properly improved would be equal in value to ten in its natural ſtate.

Theſe obſervations evidently prove that the nation in general is eſſentially injured, if any man has more land in his poſſeſſion than he can either labour properly himſelf, or get others to improve.

As a proof of the probability that agriculture might receive conſiderable improvement, if the above plan of villages were adopted, by the experiments of the feuars, I ſhall add the following extract from Mr Marſhall. The practice of dibbling, an improvement of conſiderable importance in huſbandry, appears to have been invented by a cottager. I think, indeed, the Norfolk ſcheme is ſomewhat defective: But of this I ſhall ſpeak in a future page.

P. 35. " Minute 23. September 12. Mr " William Barnard of Bradfield, who was " born (and reſided until about three years " go) at Great Ellingham, near Attleborough, " gives the following account of the riſe and " practice of the dibbling of wheat.

" The dibbling of peaſe, he ſays, has been

" a

" a cuſtom in that part of Norfolk, time im-
" memorial; but the practice has not been ex-
" tended to wheat above eighteen or twenty
" years; nor has been in any degree general
" for more than ten years.

" The practice of dibbling wheat proba-
" bly aroſe in this manner. At Deepham,
" an adjoining pariſh to Ellingham, lived
" one James Stone, a labouring man, who
" was, in that neighbourhood, a notted dib-
" bler of peaſe, and who cultivated for him-
" ſelf a few acres, which he rented with his
" cottage. He had three children, who were
" as expert at " dropping," as the father was
" at " dabbing;" and having ſome acre or
" two of clover-lay, which came in courſe
" for wheat, he conceived the idea of dib-
" bling in the ſeed; probably thinking, that
" he ſhould thereby keep his children from
" idleneſs, and ſave them, at the ſame time,
" an unexpected ſupply of bread.

" He accordingly ſet about putting his
" ſcheme in execution, and preſently brought
" his neighbours about him. Some of them
" ſmiled, and others laughed at his experi-
" ment. He, nevertheleſs, proceeded with
" his little crops, and finiſhed his patch.

" The

" The land being in good condition, and
" the work being done in a masterly manner,
" the plants came up so strong and beautiful
" as to draw the eyes not only of his fellow-
" parishioners, but of the whole neighbour-
" hood.

" Mr Barnard well recollects the circum-
" stance, for he passed by the close (which
" lay by the side of a public road) every day
" in his way to and from school; and says,
" that he has frequently seen the neighbour-
" ing farmers, in their way to market, light
" at the gate, and go into the piece, to view
" the crop, which was now become popular.

" At harvest the crop proved extraordina-
" rily good; and the dibbling of wheat has,
" from that time, been more or less practised
" in this circle of the county: The only one
" in which the practice is, even yet, become
" general among farmers.

" Enquiring of Mr B. the proportion
" which dibbled wheat in that county bears
" to the wheat sown broad-cast, he says,
" there is as much dibbled as there can be
" hands got to put it in; and apprehends
" that one half of the wheat about Wynd-
" ham and Attleborough is dibbled in; add-
" ing.

" ing, that when wheat is dear, the work
" people are engaged ſome months before-
" hand, and frequently when they are paid
" off for dibbling peas in March, they are
" engaged for the wheat-ſeed time.

" Succeſſion. A clover-lay once plowed is
" what is generally made uſe of for dibbling;
" it has however been tried with a conſide-
" rable ſhare of ſucceſs, on fallow-ground.

" Manure. The common practice is to
" ſpread the dung, or other manure, pre-
" ſently before the ground be plowed. Some
" lay it on after the ſeed is in, by way of
" top-dreſſing. But Mr B. is of opinion,
" that ſetting on the manure in July, and
" letting it waſh into the ſoil before plowing,
" is the moſt eligible way of manuring for
" dibbled wheat.

" Soil proceſs. If the ſoil be light, and
" the weather dry, the plowman keeps pace
" with the dibblers; the holes will not other-
" wiſe ſtand, the ſand running in, and filling
" them up. The furrow, provincially, *flags*,
" ſhould be cut about ten inches wide, and
" be turned over flat and even; and to make
" them ly ſtill ſmoother and firmer, they are
" rolled pretty hard before dibbling.

" The

" The dibbles made uſe of in this opera-
" tion, are of iron. The acting part is an
" egg-ſhaped knob of iron or ſteel, ſome-
" what larger than a pigeon's egg; the ſmall-
" er end forms the point of the dibble, whilſt
" from the larger riſes a ſtring of iron, about
" half an inch ſquare, and two feet and a
" half long. The head of it is received into
" a croſs piece of wood, (reſembling the
" crutch of a ſpade or ſhovel) which forms
" the handle.

" The dibbler makes uſe of two of theſe
" tools, one in each hand; and, bending o-
" ver them, walks backward upon the flags,
" making two rows of holes in each. The
" rows are uſually made about four inches
" apart, and the diſtance in the rows from
" two and a half to three inches; namely,
" four holes in each length of the foot of the
" dibbler.

" The great art in making the holes lies in
" leaving them ſmooth and firm on the ſides,
" ſo that the looſe mould do not run in to
" fill them up before the ſeeds are depoſited.
" This is done by a circular motion of the
" hand and wriſt, which makes a ſemi-revo-

" lution every ſtroke; the circular motion
" beginning as the bit enters, and continues
" until it is clearly diſengaged from the
" mould. The dibbles muſt come out clean,
" and wear bright, or the operation is not
" perfect.

" Another difficulty in dibbling is to make
" the holes at equal diſtances; more eſpeci-
" ally, to keep the two rows ſtraight and
" parallel with each other: For the dibbles
" being two diſtinct inſtruments, it requires
" ſome practice to guide them with preci-
" ſion, ſo as to pierce the flag in the exact
" point required. To remedy this, couples
" have been invented to keep the dibbles at
" a given diſtance; but this renders the in-
" ſtrument complex, and prevents the learn-
" er from ever being able to uſe them ſingly.
" A man muſt be awkward indeed, if he does
" not in a few days, without this incum-
" brance, make himſelf a tolerable maſter of
" dibbling.

" A middling workman will make two
" motions or four holes in a ſecond.

" One dibbler employs three droppers;
" therefore one man and three children are
" called a ſet. Each dibbler takes three flags,
" which

" which he performs upon by ſtages thus: " He firſt takes an outſide flag, and having " gone ſome yards upon that, he returns, not " upon the next flag, but upon the other " outſide flag of the three, and then finiſhes " his ſtage by taking the middle one. This " is done to keep his three droppers fully " employed, and at the ſame time to prevent " his filling up the holes with his feet before " the ſeeds are depoſited. Were he to carry " but one flag with him, the droppers would " have to paſs each other repeatedly, and " have three times the ground to walk over; " whereas, by the above contrivance, they " are always uniformly progreſſive, and each " child finiſhes its own flag.

" The droppers keep up with their dibbler, " putting two or three grains of wheat in " each hole, (but of peaſe only one). The " girls carry the ſeed in their aprons, the " boys in their hats, or other contrivance. " Out of thoſe they take about half a hand- " ful, and deliver the ſeed into the holes " through an aperture made between the firſt " and ſecond fingers. Much time and pa- " tience is neceſſary to teach a child to per-

" form

" form this petty buſineſs with propriety and
" diſpatch.

" The preſent price of dibbling a free light
" ſoil is nine ſhillings an acre, and beer. It
" formerly was half a guinea. If the ſoil be
" ſtiff or ſtony, it is now worth more than
" that money. The dibbler is a ſort of maſ-
" ter of his ſet; for if he has not children of
" his own, he hires his droppers, giving
" them ſixpence a-day each if expert hands,
" or three pence a-day if learners: two of
" them being employed on one flag, each
" taking one row of holes; ſo that he pays
" for dropping, three pence a-day for each
" row of holes. An expert dibbler will *hole*
" half an acre a-day, which, at nine ſhillings,
" is four and ſixpence, out of which he pays
" one ſhilling and ſixpence to his droppers.
" But one third of an acre is reckoned a fair-
" day's work; which at nine ſhillings an
" acre, is three ſhillings; out of which pay-
" ing one ſhilling and ſixpence, he has one
" ſhilling and ſixpence left for his own day's
" work.

" Quantity of ſeed. One buſhel to ſix
" pecks an acre; and if the flags crack much
" in plowing, ſome throw on half a peck, or

" a

" a peck an acre, broad-caſt, before roll-
" ing.

" Covering the ſeed. This is uſually done
" by going twice in a place with a buſh-har-
" row, made by drawing thorns into a gate
" or a large hurdle. Either of theſe, how-
" ever, Mr B. ſays, and with reaſon, makes
" too large an implement: For in ſo large a
" ſpace as this covers at once, there will be
" protuberances which it will lay hold of too
" much, and probably pull up, and hollows
" which it will wholly miſs. He has uſually
" preferred a waggon-ladder, which does not
" cover more that four or five flags at once;
" and to finiſh this buſineſs more compleatly,
" he always carries a ſort of broom in his
" own hand, when overlooking the work
" people, in order to cover more effectually
" any part which may be partially miſſed.

" The advantages held out. There is a
" ſaving of about a buſhel and a half of ſeed;
" which, when wheat is ſix ſhillings or up-
" wards, is alone equivalent to the extra ex-
" pence of dibbling.

" The rolling and treading is eſteemed
" highly ſerviceable to the light lands of this
" country.

" The

" The edges of the flags being intimately
" united by the rolling and trampling, and
" the remaining fiſſures being filled up by
" the harrow, the graſſes are thereby thought
" to be kept under; and ſhould ſeed-weeds
" appear in the ſpring, the hoe has
" free admiſſion between double row and
" double row to extirpate them; an opera-
" tion, however, which I underſtand ſeldom
" takes place.

" The ſeed being wholly buried in the bo-
" dy of the flag, there is no " under-corn;"
" the plants are uniformly vigorous, the
" ſtraw, collectively, is conſequently ſtouter,
" and the grain more even, than that which
" is uſually produced from ſowing the ſeed
" broad-caſt over the rough flag. For, in
" this caſe, part of the ſeed falls through be-
" tween the flags, and being there too deep-
" ly buried by the harrows, the young plants
" are longer in reaching the ſurface than are
" thoſe from the ſeed, which happens to fall
" in a more favourable ſituation; and which
" thereby gain an aſcendency they never
" loſe. Hence a number of underling plants,
" and hence the ſmall ſhrivelled grains, which

" render

" render the ſample unſightly, and unſale-
" able.

" Another good effect remains to be no-
" ticed, the employment of the poor: And
" whether we view this in a moral, a politi-
" cal, or a private point of view, it is equally
" deſireable. For the poor's rates of a coun-
" try village fall principally on the farmer;
" and if he does not employ the poor, he
" muſt ſupport them in idleneſs, more eſpe-
" cially children. Mr B. ſays, that in the
" circle above-mentioned, wheat ſeed-time
" is conſidered, by the poor man, as a ſecond
" harveſt."

To do juſtice to dibbled wheat, it ought to be dibbled in ſtraight lines, ſo as the hoe may paſs between the rows. A hoe made of a triangular form, and ſomewhat riſing in the middle, would not only cut the weeds or graſs, but, at the ſame time, throw the earth to the roots of the wheat, which would make it ſpread off the root.

Laying three chalders of hot powdered lime on each acre, with the dung, would help to rot the graſs, and make the ſoil free and tender; but dung alone encourages the

growth

growth of the graſs. It would be better to lay on the dung for a peaſe crop, and a wheat crop to ſucceed; the ground to be plowed, harrowed, and rolled before drilling: Or, plowing the graſs ground in dry weather, ſome weeks before ſowing or drilling, might help to kill the graſs. It is to be ſuppoſed, that dibbled wheat would anſwer better upon fallow than upon graſs.

What is ſaid in National Improvements, p. 386, concerning the manner of drilling, would anſwer equally well with dibbling, and perhaps better, and much cheaper. What Mr Marſhall ſays about dibbling, proves that the mode of drilling here alluded to, may be reduced to practice with every ſpecies of grain.

It is evident, that were the proper rotation of crops to be obſerved, and the waſte grounds to be brought in, the produce of this iſland muſt not only be increaſed in ſuch a manner, as amply to ſupply the preſent number of inhabitants at a very cheap rate, but likewiſe to afford immenſe quantities for exportation.

When Britain was ſo improved as to have large

large quantities of corn to export, we might then attempt to raiſe as much flax and hemp as the nation needed. Nor would the effecting of this happy change be attended with great difficulty, were all ranks of men heartily to concur in purſuing the proper means for its accompliſhment.

The greateſt obſtacle, however, lies with the people themſelves. It muſt be owned to be a difficult matter to cauſe a whole nation to adopt one ſcheme of rotation of crops; but the greateſt difficulty would be, to convince the farmers, who are, in general, wedded to their own old cuſtoms, that they are in the wrong. And, indeed, ſo great is this difficulty, that I apprehend it could ſcarcely be overcome without the interference of government.

Would the Britiſh government adopt a regular plan, capable of being ſucceſsfully reduced to practice throughout the whole nation, ſuch as has been already mentioned, and to give premiums to the farmers who raiſed the greateſt crops; would the noblemen and gentlemen adopt the ſame, not only recommending it to their tenants, but likewiſe raiſing ſubſcriptions to encourage them; and if

a number of the principal farmers in each county were to enter into it alſo, it would undoubtedly influence the generality to follow their example; eſpecially as the benefits ariſing from ſuch a ſcheme muſt very ſoon appear.

That it is the primary intereſt of Britain to give encouragement to improvements in agriculture, we hope will now appear clearly evident to every diſintereſted perſon, who will only take the trouble to conſider what is the preſent produce of Great Britain, and how much that produce might be increaſed, if only a part of the beſt ſoils, now lying waſte, were improved; and what great improvements could be made upon thoſe farms ſaid to be improved, by having a regular rotation of crops of corn and graſs; taking care neither to have too much in the one, nor too much in the other.

The mere article of ſaving ſeed would aſtoniſh every one, were it to be put in practice as recommended in the National Improvements; beſides, that by this very ſaving, the annual produce would be conſiderably increaſed.

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How much the whole product of Britain might, on this plan, be augmented, we muſt leave to be determined by every one's judgement or calculation.

It is univerſally acknowledged, that there is not one acre in an hundred improved as it ought to be, of the ground capable of improvement in Britain. This is manifeſted by the vaſt number of different ſchemes of managing almoſt every farm in each county or ſhire. Now it is certain, that a great number of theſe methods uſed at preſent are very hurtful to the farmer, the landlord, and the nation in general. But the great difficulty lies in convincing a number of ignorant and conceited farmers that they are wrong, and that it would be greatly for their intereſts to alter their preſent modes of cropping: Nor, indeed, would it be much leſs difficult to convince the landlords, that they are hurting themſelves, the farmers, and the nation in general, by the methods they take in letting their farms. But if once a regular plan was fixed upon, and begun to be put in practice, the farmers would ſoon ſee it for their intereſt to continue the ſcheme, and probably,

bly, the progreſs might be exceedingly rapid.

A national ſyſtem in agriculture, ſo far from hurting either the farmer, the landlord, or the nation in general, will tend greatly to the intereſt of the whole.

If a national ſyſtem were once fixed upon, it would prevent the farmer from hurting himſelf, and turn out greatly for the intereſt of the landlord and the nation. The farmer would be daily learning, by ſeeing the great crops that were produced over the whole nation, by following this plan.

Too great a number of acres in corns, in a courſe of years, ruins the ſoil. Too great a number of acres in graſs hurts population, and tends to make proviſions dear.

The farm, after having been a certain number of years in graſs, would not only produce great crops of corn, the corns would produce very great quantities of dung, and the dung would produce rich crops of graſs; ſo that the very ſame acre that was in paſture would produce double, or three times the quantity of graſs; that is, would maintain three times the number of cattle with the

corn,

corn, ſtraw, and graſs together. The greater number of cattle, the greater quantity of dung, and the more dung, the more corns. So that it may be averred as a certain fact, that every farm will produce three or four times the quantity of corns and graſs, by having a regular rotation of crops, which the ſame farm will produce by having it wholly in corns, or wholly in graſs, in the courſe of twenty years; or, in other words, the profits would be three or four times greater, by having a regular rotation of corns and graſs.

From this we may draw two concluſions.

1ſt, The farmer who keeps his farm wholly in graſs, after a certain number of years, is hurting himſelf, and the nation at large, by withholding the great crops of corns the farm would produce.

2dly, That farmer is hurting himſelf and the public, who has his farm wholly in corn crops; for, in a courſe of years, the ſoil is tired or exhauſted, conſequently, the crops every year declining; beſides, the expence of labouring is double for ſeed, tillage, and manure: Whereas, if he had the one half in

graſs,

graſs, he would labour it for one third of the expence, and have more corns upon the one half, than upon the whole, when all is in tillage.

The advantages accruing to the farmer by following the plans propoſed, viz. of having only the one half of the farm in tillage, and the other half (in ſome places two-thirds) in graſs, are manifold. Firſt, It divides the labour, ſo that the work is never crowded, or hurried, having one-tenth part in fallow for wheat done in autumn, one-tenth for oats broke up from graſs five or more years old, plowed in autumn; one for peaſe or beans, potatoes or turnips, to be dunged in the winter or ſpring; and one for barley without dung. By following this plan the work is never hurried; at the ſame time, men and horſes are employed every month in the year.

2dly, There is another great advantage: All the farm would be in ſuch good order, and ſo rich, not dunging above a tenth part every year, that all the corns could be ſown much earlier than in the ordinary way. When the ſoil is rich and clean, it will admit of

of being very early ſown, when the ſeaſon will permit. This makes an early harveſt, which is, for the moſt part, the beſt, and ſubject to leſs riſk of being hurt by high winds and froſts.

The third advantage of early ſowing is, that the wheat being all from fallow, could be plowed in with a fur two or three inches deep, which would in ſome meaſure prevent the froſts and ſmut from hurting the wheat.

The grain that is early ſown is, for the moſt part, far ſuperior in quality to the ſame grain ſown late. The reaſon is obvious; the early has more of the ſun, when in his greateſt heat, in the time of ripening. The Engliſh wheat and barley are eſteemed of a much better quality than the Scots, for the above reaſon of being earlier ſown and cut down. The Engliſh wheat and barley ſome years ſell 15 or 20 per cent. dearer than the Scots, which proves them to be of a ſuperior quality. The barley, by this plan can be ſown in the month of March, which would make the quality of the grain better than when ſown late.

The laſt advantage is, That when the ſoil

is

is rich and clean, both leſs ſeed and manure will ſerve, and produce a better crop, than when the ground is dirty and full of weeds, although it gets more ſeed and manure.

When the ſoil is rich, it can be ſown with the early Eſſex, or Dutch oats, which do not anſwer upon poor ground. The Dutch oats often produce, when ſown upon good ground, double of what the common oats do upon the ſame ground, and take leſs ſeed.

It is particularly to be obſerved, that moſt of the farmers in Scotland, who have made the greateſt fortunes upon ſmall farms, the largeſt not exceeding 300 acres, have practiſed a ſteady and regular rotation of crops of corn and graſs, with a fallow. More inſtances can be given of theſe making money, than either thoſe whoſe rotation was wholly corns or wholly graſs, each having the ſame number of acres.

Suppoſing the national ſyſtem to be one half in graſs, and one half in corns and fallow, or (in ſome places far from manure or ſea ports) two thirds in graſs, and one third in corns and fallow.

In order to make this ſyſtem become general, the government ſhould give premiums

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in every county or ſhire, *L.* 5 each acre, for the beſt crop of wheat not exceeding ten acres, and ſo on for every other crop mentioned in the ſyſtem. And in order to raiſe a fund for theſe premiums, every farmer that had more than the one half of his farm in corns, to pay ſixpence for each acre to government, and ſixpence for each acre he had in graſs above two-thirds; ſixpence each acre of all waſte grounds capable of improvement, that were neither improved nor planted: the ſum raiſed in this way to be wholly allotted for premiums to thoſe who raiſed the beſt crops in following the national ſyſtem. The premiums to continue for twenty years at leaſt.

This national ſyſtem would naturally increaſe both the quantities of corn and graſs, if once it came to be generally practiſed; the produce would be ten times what it is at preſent, and no farmer hurt.

No doubt many may object to this tax upon land, thinking it deſigned to hurt the farmers: But the contrary is what I intend by this propoſal; namely, to be a great ſervice to the farmer, the landlord, and the nation in general.

If it be a fact, as has been alledged, that the greater part of the farmers, by the way they manage their farms, are not only hurting themſelves, but greatly injuring the public; many of them will not be convinced that they are wrong, being ſo wedded to their old ſchemes. Now, it is only propoſed that government ſhould give large premiums to thoſe who raiſed the greateſt crops by following the national plan; and thoſe who did not chuſe to follow this plan, might be allowed to follow their own, upon paying ſixpence per acre, in order to raiſe a large ſum to be given in premiums, only to let every farmer ſee, how very large crops the ſoil can be made to produce in ordinary ſeaſons, when under proper culture. And as it is propoſed, that an annual regiſter ſhould be kept, mentioning the greateſt crop each diſtrict of the whole nation produced, and publiſhed every year in the newſpapers, this would ſhew, at one view, where the largeſt crops were raiſed; then the farmer would judge for himſelf, if it was for his intereſt to adopt the national plan.

It would be every farmer's intereſt to contribute to ſuch a ſcheme, whether he was

bound

bound or not. It cannot, indeed, be expected, that this plan can be accomplished withous the interference of the legiſlature. Many would not join, although it ſhould be for their intereſt; but an act of parliament would eaſily eſtabliſh the ſcheme.

Suppoſe a farmer had 200 acres, which, according to this plan, ſhould be one half in graſs and the other in corns; if he thought it was more for his intereſt to have only 80 acres in graſs, in that caſe he would have only to pay 10 s. each year, and ſo on in proportion to his, and every other farm.

No farmer that had 200 acres could ſay it would be hard for him to pay 10 s. when this very money was given for experiments whereby he himſelf might reap perhaps every year ten times the ſum he paid, or conſiderably more; for this ſcheme would be the means of diffuſing univerſal knowledge throughout the whole nation, and would prove, in a few years, what has been ſaid before, that it would be much for the intereſt of the farmer and the nation at large, to have a regular rotation of corns, graſs crops, and fallow.

After pondering much upon what might be

be the moſt effectual and rapid means to have as much as poſſible one national ſyſtem, I could think of no ſcheme that would anſwer the end ſo much as this, and make ſuch rapid progreſs.

Only let any perſon, before he draw a concluſion, conſider what the good effects would be, if ſuch a plan was adopted, and lay in the balance any ſuppoſed hardſhips the farmer would ſuffer.

It will give me great pleaſure to ſee a better plan adopted, either by government, or by noblemen, gentlemen, and farmers uniting in one. I do not mean to be tenacious as to this plan, but only to give hints that others may improve upon them.

It has been objected, that it is not conſtitutional to tax the farmer's labour. I do not ſee any force in this objection. Is not the produce of the land taxed, in the land and malt taxes, in the duties upon leather, ſoap, candles, ſtarch, beer, ſpirits, &c. &c.? What injuſtice then is there, in taxing a farmer; and eſpecially, when this tax is to promote his own intereſt?

If the farmer is doing evident hurt to himſelf and the nation, it is doing him and the

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nation a great ſervice, to convince him he is wrong.

The author does not mean, from what is ſaid in all this reaſoning, in the ſmalleſt degree to diſcourage trade and manufactures; on the contrary, he wiſhes them all manner of ſucceſs, and rejoices to ſee them increaſe. He only attempts to ſhew, that agriculture is the primary intereſt of Britain, and the more that it is encouraged, the more our trade and manufactures increaſe, and may be the means of bringing in a great and permanent revenue to Britain. What he has endeavoured to prove is, that encouragement ſhould be given to agriculture in preference to trade and manufactures; or, at leaſt, the encouragement ought to be equal. Indeed, they are ſo nearly connected, that they ought never to be viewed ſeparately; for, as the one increaſes ſo does the other. Agriculture is the foundation on which trade and manufactures ought to build; and to how great height it might be raiſed upon ſuch a ſolid foundation, it is hard to determine. Agriculture may be compared to the water-wheel, which ſets all the other wheels in motion.

It is a great miſtake in many people to imagine,

imagine, that trade and manufactures might be ſucceſsfully carried on, though agriculture ſhould be neglected, and Britain remain in its preſent unimproved ſtate.

Surely, commerce and manufactures cannot be carried on ſo advantageouſly, as they might, if the country was better improved. England is ſuppoſed to produce above ten times the quantity of corns that Scotland does; and, of conſequence, manufactures are there carried on to a much greater extent.

Arguments, however, are unneceſſary in the preſent caſe; for it is obvious to every one, that were agriculture brought to that height of improvement for which we contend, trade muſt be greatly increaſed, even by the exportation of its ſurplus; and population would be greatly increaſed by the reduction of the price of proviſions.

The author may here be allowed to expreſs his ſatisfaction, that the eſſays, intitled "National Improvements," ſo often referred to in the preceding pages, have met with general approbation. In theſe he endeavoured to prove, what is before ſaid, that by following the directions he has laid down, the produce of Britain would be increaſed to ten times

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what it is at preſent, in the courſe of forty years.

Many eminent practical farmers have acknowledged, that the peruſal of this book has been of more advantage to them in the laſt crop, than ten times the price of it. But the greateſt recommendation of all is, that of the farmers in the carſe of Gowrie, one of the beſt improved ſoils in Scotland, which is ſimilar to the plan of huſbandry laid down in this book; and was adopted by them about ſixteen years ago.

Theſe farmers acknowledge, that by altering their ſcheme of huſbandry, they have as much profit in one year, as they had in five before. A ſtriking proof of their ſucceſs is, that they have, within theſe ſeven or eight years, bought eſtates to the amount of between ſixty and 70,000 l. ſterling.

A remarkable inſtance of the richneſs of the lands in the carſe of Gowrie, is, that Lord Kinnaird, the proprietor of the farm of Inchture, being about 300 acres, rented at 13s. 6d. per acre, purchaſed from his tenant Mr Thomas Hunter, the remaining five years of his leaſe for *L.* 3000 ſterling, which his Lordſhip has let at *L.* 2 : 15 s. per acre for nineteen

teen years. This purchaſe was made by the above noble Lord in 1787.

The approbation of ſo many intelligent practical farmers in every part of Scotland, gives the author infinitely greater ſatisfaction than any praiſes which Reviewers can beſtow upon his work. And as to their cenſures, he profeſſes to deſpiſe them. Their opinions, for the moſt part, proceed either from ignorance or prejudice: Nor, indeed, do they think it below their dignity to publiſh ſentiments that are not their own; nay, without having even read the ſubject on which they pretend to treat.

Since writing the preceding pages, I have converſed with many gentlemen and farmers: Some of them are of opinion, that dividing the whole of Britain into diſtricts of about twelve miles long, and four broad, the improved parts by themſelves, and unimproved parts by themſelves, every farmer paying a ſmall taxation every year for each acre of his farm, in order to raiſe a ſum to be given as premiums to thoſe who raiſe the greateſt crops upon ten acres, agreeable to the plan propoſed for a national ſyſtem. This money

money to be diſtributed in the diſtrict in which it is raiſed, and to be applied to no other purpoſe than the above premiums. And whatever the ſum was that the farmer paid for each acre, the proprietor of the lands to pay the ſame for each acre upon his eſtate. This would be a good ſcheme for every proprietor to follow over all his eſtate, although not patroniſed by government. This is only raiſing premiums to be given to the beſt farmers in every eſtate, which would encourage improvements, and ſoon teach the moſt ignorant, that it was better to improve one acre properly, than three or four in the ordinary way.

And in order to make the prizes as equal as poſſible, ſo that farmers of different ſtations might each of them receive ſeveral premiums, it is propoſed, that there ſhould be three different claſſes of prizes, the firſt *L.* 50, for ten acres, for the beſt crop of wheat after ſummer fallow, and the next year the ſame ſum for a green crop, and ſo on.

The ſecond claſs, *L.* 25, for the beſt crop upon five acres.

The third claſs, *L.* 10, for the beſt crop upon two acres.

Each of the claſſes to have ſix premiums every year.

The firſt, for the beſt crop of wheat, after a ſummer fallow.

The ſecond, beſt green crop after wheat.

The third, beſt barley with graſs ſeeds.

The fourth, beſt hay crop.

The fifth, beſt paſture.

The ſixth, beſt crop of oats after being five years in graſs.

Theſe premiums to continue ten or twenty years at leaſt.

Some of the farmers might be entitled to the whole, or for as many of their crops as were judged beſt: But no farmer to receive more than one prize for each grain, that is, ſix prizes in whole, during the firſt ten years; but the ſecond ten years, to have a right to compete as before.

This would be a more certain way of gaining than the lottery; for every farmer would be rewarded according to his merit, ingenuity, and induſtry: And as ſome farmers might gain, in the ſpace of ten years, the ſix prizes, which would be *L.* 300 for the firſt, *L.* 150 for the ſecond, and *L.* 60 for the third claſs,

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no farmer could reaſonably complain of his annual taxation, when he is thus rewarded according to his merit; for he, and every farmer has a chance of gaining one or more of theſe premiums who has only an hundred acres, and pays, we ſhall ſay, two pence halfpenny for each acre, which is a guinea annually; and this for ten years is only ten guineas for the higheſt claſs, and for this he has a chance of gaining *L.* 300, and almoſt a certainty of gaining more than one prize, if he is induſtrious, although he does no more than follow the example of thoſe that gained the prizes before him.

In the courſe of ten years, there would be ſixty prizes of *L.* 50 each, which would make *L.* 300 annually; ſixty of *L.* 25 each, *L.* 150; ſixty of *L.* 10 each, *L.* 60, in each diſtrict; ſo that the rich farmer, who has a large extent of ground, and the poor one who has but a ſmall portion, have each a chance to gain ſome of theſe premiums, if they pay attention to thoſe that gained the prizes before them.

But although the farmer ſhould gain no prize at all, yet he would be a greater gainer than

than the annual taxation, by learning from the example of others in the neighbourhood, where an annual regiſter of each year's produce ſhould be kept, and to be open to the inſpection of every farmer. The proprietor of every eſtate would gain ten times more than his annual taxation; in ſome parts upwards of an hundred fold, by getting his whole eſtate improved in the higheſt order.

Beſides, any gentleman that inclined, might have a chance for ſome of the premiums, by labouring a part of his eſtate himſelf.

As it is to be underſtood, that no farmer could gain more than one prize for each grain, that is, ſix prizes in whole, this would make the greater part of the farmers almoſt certain of one prize at leaſt in ten years.

Each diſtrict of the improved part of the country, twelve miles long and four broad, would raiſe an annual ſum of above *L.* 550, which would pay the three claſſes of premiums.

If the whole of Britain was divided into diſtricts, according to their natural ſituations, ſome larger, ſome leſs, this would make the improvements very rapid, and no perſon

would

would be a ſufferer by the taxation; as both gentlemen, proprietors, and farmers in each diſtrict, could eaſily ſee, that the whole of that money was ſolely applied for encouraging improvements in agriculture, and to no other purpoſe. And as this ſcheme would increaſe the whole produce of Britain, and conſequently reduce the price of proviſions, therefore the inhabitants of large cities and towns ought likewiſe to contribute a proportion, as well as the nobility, gentlemen, and farmers in the country.

Suppoſe a gentleman had a thouſand acres of land, in but indifferent order, his own taxation would only be ten guineas annually. By this ſcheme, in the courſe of forty years, his rents would be more than doubled, and the whole improved in great order, and would ſtill be improving ſo long as the ſcheme continued; and to this may be added his chance of gaining premiums himſelf. No gentleman need heſitate to pay one guinea for every hundred acres, when he would reap ſo much advantage. Six and twenty gentlemen, having a thouſand acres each, the farmers paying the ſame, would raiſe five

hundred

hundred and forty guineas, which is the ſum wanted for prizes.

It muſt be obſerved, that it will take five years before the whole ſcheme of premiums can take place, as is propoſed in this plan; therefore the premiums will vary for the firſt five years. After that period they are always the ſame.

The order they will take is as follows; as there are three hundred pounds to be divided every year, which admit of three premiums for each article for five years; viz. one of L. 50, one of L. 30, and one of L. 20, which in whole is L. 100.

Firſt year, for the beſt crop of wheat of ten acres, after ſummer fallow, the higheſt prize L. 50, the ſecond L. 30, and the third L. 20, in whole L. 100; and ſo on, the ſame ſum for every article, which will be ſhown by the following tables.

PREMIUMS

PREMIUMS for 10 ACRES.

	10 Acres Wheat. Prizes.			10 Acres Green Crop Prizes.			10 Acres Barley. Prizes.			10 Acres Hay. Prizes,			10 Acres Pasture. Prizes.			10 Acres Oats.	Total of Prizes for one Year.
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3		
1ſt year	50	30	20														100
2d year	50	30	20	50	30	20											200
3d year	50	30	20	50	30	20	50	30	20								300
4th year	50	30	20	50	30	20	50	30	20	50	30	20					400
5th year	50	30	20	50	30	20	50	30	20	50	30	20	50	30	20		500
6th year	50			50			50			50			50			50	300
																	1800

PREMIUMS for 5 ACRES.

	5 Acres Wheat.			5 Acres Green Crop			5 Acres Barley.			5 Acres Hay.			5 Acres Pasture.			5 Acres Oats.	Total of Prizes for one Year.
	Prizes.			Prizes.			Prizes.			Prizes.			Prizes.				
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3		
1st year	25	15	10														50
2d year	25	15	10	25	15	10											100
3d year	25	15	10	25	15	10	25	15	10								150
4th year	25	15	10	25	15	10	25	15	10	25	15	10					200
5th year	25	15	10	25	15	10	25	15	10	25	15	10	25	15	10		250
6th year	25			25			25			25			25			25	150
																	900

PREMIUMS for 2 ACRES.

	2 Acres Wheat.			2 Acres Green Crop			2 Acres Barley.			2 Acres Hay.			2 Acres Pasture.			2 Acres Oats.	Total of Prizes for one Year.
	Prizes.			Prizes.			Prizes.			Prizes.			Prizes.				
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3		
1ſt year.	10	6	4														20
2d year.	10	6	4	10	6	4											40
3d year.	10	6	4	10	6	4	10	6	4								60
4th year.	10	6	4	10	6	4	10	6	4	10	6	4					80
5th year.	10	6	4	10	6	4	10	6	4	10	6	4	10	6	4		100
6th year.	10			10			10			10			10			10	60
																	360

The laſt Claſs of Prizes applies either to Plough or Spade Culture.

This ſcheme is no more than doubling the value of the prizes for the firſt five years; after which period they have only L. 50 each. But if gentlemen and farmers thought proper to continue the plan, three prizes for each article, it would only require the taxation to be doubled on the ſixth and the ſucceeding years. By this means it would increaſe the number of prizes three to one. Five pence each acre, in place of twopence halfpenny, would anſwer the purpoſe.

The gentlemen and farmers might adopt either of theſe ſchemes they thought proper themſelves. But the having of three prizes for each article, during the firſt five years, would be of great ſervice to introduce the ſcheme, although not continued.

In order ſtill to make the ſcheme more univerſally uſeful, ſo that it might be adopted by the loweſt claſs of mankind, there ought to be in every diſtrict three claſſes of prizes for the ſpade culture, in the ſame order, and for the ſame articles as thoſe for the plough culture. They need not at firſt be upon a large ſcale, as it is only propoſed to ſhow the difference between the plough and ſpade, and to introduce

introduce the drilling and dibbling in the beſt manner.

It is propoſed that there ſhould be three different claſſes of premiums.

The firſt L. 10 for two acres, for the beſt crop of wheat, laboured with the ſpade, drilled, or dibbled; and the next year, the ſame ſum for a green crop, and ſo on, as in the former ſcheme.

The ſecond claſs L. 5, for one acre for the beſt crop of wheat.

The third claſs 50 ſhillings, for half an acre, and ſo on; each of the claſſes to have ſix premiums every year, as is particularly expreſt in the former ſcheme.

Another advantage the ſpade culture would have, is, that it would promote the increaſe of villages, and alſo augment population. This would require a ſum of 100 guineas every year for each diſtrict. One halfpenny per acre additional tax would raiſe this ſum.

Perhaps, in ſome parts of the highlands, it might be thought better to have no premiums at firſt, but for the ſpade culture. The value of the prizes would be in proportion to the value of the ſum raiſed in each diſtrict.

Were a model of a bill for eſtabliſhing this

ſcheme

ſcheme printed, with a full explanation of what is intended by it, and ſent to every pariſh in the kingdom for their conſideration, the ſenſe of the nation would be eaſily taken upon the ſubject. And although they ſhould diſapprove of this plan, yet ſome other might be ſuggeſted, which might obtain univerſal approbation, and become beneficial to the nation at large.

It may be objected, that it would be very difficult to determine which farmer had the beſt crop of each kind of grain and graſs.

In anſwer to this, I only wiſh we had the proper funds for the premiums. Every diſtrict could contrive how to fix on proper methods, to determine which of all the farmers in that diſtrict was intitled to the prizes in each claſs.

Suppoſing there were twelve perſons fixed upon to be judges, that is, one perſon for every mile in length of the diſtrict, each living a mile diſtant from the other; they could not only view the crops when growing, at different ſtages, and make their obſervations thereupon, but likewiſe, after the corn was cut down, might take the number of ſtooks or ſheaves in each field.

The

The judges ought to recommend to the farmers to make their ſheaves of an equal bind; and before the grain in each field was carried home to the barn, or corn-yard, it might be proved by taking the five and twentieth ſtook, or ſheaf, and threſhing it out; this would give the contents of the whole. Or, the contents of each field might be carried to the corn-yard in the uſual way, and covered up, till it was all ready for threſhing; then to be proved as above, by taking the five and twentieth ſheaf, and threſhing it out.

Thus two or three men might ſee one field proved in three or four hours time. So that by following this method, they could prove a number of fields in one day. And, if it were thought proper, it could be proved both from the field, and after lying ſome weeks or months in the barn-yard. And after all, the farmer to whom each field belonged, ſhould keep an account of the whole produce of that field, after being threſhed out.

The hay crop to be ſtacked up in the ſame field where it grew, to be meaſured after lying for ſome time, and likewiſe an account kept of the number of ſtones delivered. Or, the

hay

hay on each field could be weighed before ſtacked, or put into a rick.

It would naturally occur to the judges, to take proper methods for aſcertaining which was the beſt crop, both of corns and graſs.

It may be very difficult to aſcertain which is the moſt valuable field for paſture; but the ſureſt way would be to weigh all the cattle before they went into each field, and to be certain that they have neither got meat nor water for twelve hours before weighed; and to weigh them after the whole paſture was conſumed, at the latter end of the ſeaſon, provided they ſtood twelve hours without meat and drink, before they were taken out of the field.

The laſt years paſture, before the ground was broke up for oats, would be the moſt equal way for aſcertaining which field was of greateſt value.

By ſubtracting the weight of the lean cattle when they went into the field, from the weight of the ſame cattle when they went out, would ſhow the increaſe of weight of the cattle in each field.

To know the beſt methods to improve paſture

ture grounds are as neceſſary as to know how to increaſe the produce of corns. There is no method in improving paſture grounds would anſwer better than watering, where the water can be made to ſtand dead upon it, in autumn and ſpring, after the cattle are taken off; and even where that cannot be obtained, collecting the water in the winter time, that comes from the lands that are ploughed, and making that water run upon the field that is either in paſture, or hay, would enrich it very much; as the rain water that comes from a field that is in tillage, when full of lime and dung, is richer than the water that comes from a ſpring.

Care ſhould be taken, not to let the water run too long in one part of the field; but altering it, till it go over the whole, and returning the ſame way back, ſhifting it from place to place: So that, in almoſt every ſituation, graſs grounds can be enriched very much by waters laid on, either from rivers, rivulets, or ſprings, or rain water, perhaps conducted a conſiderable diſtance from plowed fields.

Suppoſe rain water from plowed fields was conducted

conducted a mile diſtant, which could be done for twenty-five ſhillings. A tract, a foot deep and a foot wide, would advantage the graſs fields conſiderably more than all the expence. Hot lime laid upon the ground in the month of July, immediately after the firſt cutting of hay, would double the value of the paſture.

Another objection may be ſtarted, viz. That it would be very difficult, when dividing the country into diſtricts, to get all the farms of equally good ſoil; and, of courſe, the good farms at preſent high rented would obtain almoſt the whole of the premiums.

There is not ſo much force in this objection as may appear at firſt view. The very end of dividing the whole country into diſtricts is to endeavour, as much as poſſible, to bring the whole diſtrict into one courſe of cropping, which, in time, when perſevered in, would bring the whole very near on a level as to produce.

It is to be particularly obſerved, that in many parts of the country, the ſoil of the outfield is equally good, when improved, with thoſe farms which are already highly improved.

improved. Many ſoils, barren at preſent, when properly ſummer fallowed, drained, and then limed and dunged, will produce crops equally good with the beſt improved farms, ſometimes much better. But it muſt be owned, that poor land requires a greater quantity of both lime and dung than the rich land which has been long in tillage. But to make poor land rich is anſwering the very end of the premiums.

If any farmer gains the premium, he can very well afford to lay out L. 4, or L. 5, extraordinary upon each acre, as the profit is not confined to one crop, but many ſucceeding ones. What is to hinder the farmer, if he chuſes, firſt to trench ten acres with the ſpade or plough, and then to ſummer-fallow, after which, to give it a large quantity of lime and dung.

By the ſcheme propoſed, the firſt crop is to be after a ſummer-fallow, which will bring every ſoil more upon a par; only ſome ſoils require a larger quantity of manure than others: But the manure operates at firſt more powerfully upon new ground than old.

I had the experience of this myſelf. I

ſummer-fallowed one year ſix acres of out-field in paſture graſs. The whole would not have maintained a cow for the ſummer time. I dunged it extraordinarily well upon the fallow, and ſowed it with $4\frac{1}{4}$ bolls of wheat, which is about two quarters. There was not a field in Britain that had a better appearance; but unfortunately it was too luxuriant, and the great rains in July laid it quite flat, and it never roſe again untill it was cut with the ſickle. The ſtraw was almoſt rotted. But notwithſtanding this diſaſter, it produced 60 bolls of good wheat, beſides a great quantity of ſmall. I am certain, that if that field had not been laid flat by the rains, theſe ſix acres would have produced above 100 bolls of wheat; which is as much as perhaps the beſt field in Britain would have done, being between ſeven and eight quarters per acre.

I have alſo known muir ground, where the ſoil was really poor; and which being improved according to the plan repeatedly mentioned in this work, the whole expence was amply repaid by the firſt three or four crops, although it amounted to L. 20 per acre.

Upon the whole, therefore, with reſpect

to

to produce, the difference of ſoil is not of ſo much conſequence as the mode of cultivation. The principal diſadvantage of a poor ſoil is, that it requires a greater expence to be laid out at firſt. And if this is done, it will continue to produce crops equally good with thoſe obtained from ſoils of far ſuperior quality. Only, proper attention muſt be paid, that it is not afterwards injured by over-cropping, as it is ſooner exhauſted than a good ſoil.

It is not, therefore, here pleaded, that a poor ſoil is as beneficial to the tenant as a rich one, unleſs the rent of the former is proportionably lower; but only, that if a proper mode of cultivation is adopted, the crops on each will be nearly equal in goodneſs; and that, conſequently, in determining to whom a premium ſhould be given, the difference of ſoil ſcarcely needs to be conſidered.

The author wiſhes he had greater abilities to demonſtrate how much it would be for the intereſt of the nation, and every individual to give more encouragement to improvements in agriculture. He has found himſelf much at a loſs for ſufficient powers of

language

language to expreſs, and abilities to arrange his ideas in ſuch a manner, as might convince and ſtir up perſons of all ranks to unite together, in order to promote the ends propoſed. He can only ſay, he has wrote nothing but what he firmly believes to be truth, and which might eaſily be reduced to practice. He has no intereſted ſcheme in view; but is perſuaded, that what he has propoſed is for the general good.

If theſe hints ſhould be the means of making people conſider what is the primary intereſt of Britain; or lead them to reduce to practice what is propoſed; or ſtir up perſons of greater abilities to adopt this, or any other plan that may turn out for the good of the nation, it will give him great pleaſure.

OBSERVATIONS

OBSERVATIONS

ON THE

STATE AND SITUATION

OF SOME PARTS IN THE

WEST OF SCOTLAND,

WITH RESPECT TO AGRICULTURE.

With ſome Hints for the improvement of theſe Places.

In a Journey from GLASGOW to AYR.

INTRODUCTION.

IT has been a frequent complaint againſt writers on agriculture, that they were too little acquainted with real buſineſs; that from hence their theories were often without foundation, and many of their propoſed improvements abſolutely impracticable.

In order to obviate as much as poſſible any

any objections of this nature, which may be brought againſt the preceding Eſſay, we have, in the following pages, endeavoured to apply the general principles for which we contend, to the preſent ſtate, and poſſible improvement of two extenſive diſtricts, the ſituation and ſoil of which are extremely different from each other.

From this application, it is hoped, the intelligent reader will be convinced, that an uniform and univerſal ſyſtem of agriculture is a rational plan; and that we are by no means too ſanguine with reſpect to the advantage which, we aſſert, may be derived from it.

OBSERVATIONS,

OBSERVATIONS, &c.

GLASGOW, Paisley, and the adjacent country, is perhaps more populous than any other part of Scotland, for the same extent of ground; owing to the manufacturers being very numerous: And, for this reason, the price of provisions is generally higher there than in other parts of the country.

To supply that part of the country, great quantities of corns are imported yearly from England and Ireland, and the north and east of Scotland. Some years large quantities are imported from Holland and the Baltic.

This, in a great measure, may be owing to so small a portion of the country being properly improved, and too great a proportion in grass, which is seldom or never broke up for corns; the large quantities of waste ground capable of being improved; in many places the grass but very poor, not being

enriched

enriched with lime and dung before ſown with graſs, ſo that, when broke up for corns, it produces but ſmall crops; the money that ought to be given to the farmer to improve his farm, and purchaſe manure, is ſent away to other countries to buy corns.

So long as they continue to encourage importation, they will never have corns ſo cheap as other parts of the country.

In the latter end of 1786, and the beginning of 1787, there were above an hundred thouſand pounds ſent to Ireland for corns and meal imported to the weſt of Scotland. This ſum would circulate amongſt the manufacturers in Ireland; and if they continued to import from thence, would enable the Iriſh manufacturers to underſell the Scots in the article of linen cloth, which they are doing in ſome meaſure already. Scotland, before the Revolution, ſerved Ireland with great quantities of linen; but ſince that period, while the linen trade was neglected, Ireland has introduced the manufacture of linen, and brought it to ſo great a length, by encouragement from the public, that they not only ſerve themſelves, but export linens to England to four times the value that Scotland

does;

does; and even great quantities of linen are ſent from Ireland to Scotland.

The Iriſh parliament hath given great encouragement to the improvements in agriculture, and the manufacture of linen, and is ſtill continuing to do ſo, much more than is given in all Britain. The following extract from the Intereſt of Scotland, p. 25, fully ſhows this.

"The parliament of Ireland give great "funds for the improvement of their linen "manufacture. No defect is ſooner diſco-"vered, that can be ſupplied by encourage-"ment, than it is done. The truſtees in Ire-"land gave at one time 10,000 check reels, "which were all made, and ſent, and diſtri-"buted to the ſpinners in different places of "the country, at the public charge. They "alſo at ſeveral times have made great num-"bers of good looms, completely mounted, "of the beſt kind, and given them gratis to "the beſt weavers. They are likewiſe care-"ful to remove, by public laws, every thing "that has the leaſt appearance of a diſcou-"ragement to the linen trade."

If the people in the weſt of Scotland were to lay out the ſame ſums yearly that they do

for importation, on the improvement of the country in general, to purchaſe manure, with a regular rotation of crops of corn and graſs, with a fallow, there would ſoon be great alteration in the price of corns, &c.

It is evident, that farms produce crops in proportion to what is laid out for improvement, by incloſing, draining, ſummer-fallow and manure. In many parts flooding with water will anſwer the ſame end as dung, when in graſs, and the ground well-drained before the water is let on, to ſtand for a ſhort time at different ſeaſons.

If the greateſt part of the manufacturers were in country villages, every family having a large garden laboured with the ſpade, and part in clover, it would be of conſiderable ſervice, and help to reduce the price of proviſions, and tend much to the health of the manufacturer. Suppoſe the ground was but indifferent, they would ſoon improve it with the ſpade.

When manufacturers were ſlack, as is ſometimes the caſe, the maſter not having employment for the one half of his hands, they would partly find employment in the garden; and, when at any time out of work, the

the produce of the garden would help to maintain them; ſo that they could never be in a great ſtrait, if they had a large garden well ſtocked with all kinds of roots, greens, &c. If thus the manufacturers were ſettled all over the country, they would be leſs ſubject to mobbing, when disjoined from one another.

I am informed, that many of the weavers in Germany and Ireland work at the plough a part of the day, and weave their cloth at night. Many of the Pruſſian ſoldiers are weavers, and when not employed as ſoldiers, return to the loom.

See National Improvements for a plan of a garden upon a new conſtruction, p. 270.

Many perſons who have tried labouring corn-fields with the ſpade, inform me they have found it cheaper than the plough, conſidering the great crops produced after the ſpade; ſo that they have had two bolls per acre more than after the plough.

If at any time manufacturers cannot get work, it would be better for them to be employed in labouring corn-fields with the ſpade than being idle.

I am informed, there have been very conſiderable

ſiderable ſums laid out for the improvement of eſtates in Ayrſhire; but by not following out the improvements in a proper manner, many gentlemen have ſuffered very much, not being allowed time to reap the benefits of their improvement.

Whenever any perſon, whether gentleman or farmer, engages in improvements upon a large ſcale, perhaps both above his ſtock and experience, if he does not perſevere in theſe improvements, he muſt be ſure to loſe very conſiderably.

It takes many years before great improvements will pay themſelves; and, if not perſevered in, the whole money laid out is, in ſome meaſure loſt. But if the plan be properly laid down and perſevered in, the farmer may be aſſured he will be paid both for ſtock and intereſt with profit. This is the cauſe that many loſe by giving over their farm at the very time that they ought moſt to exert themſelves. Many a man is ruined for want of friends to ſupport him in this critical time: It is like a perſon going through a river, whenever he goes beyond his depth, if not ſupported, he will be carried down the ſtream.

When

When riding through Ayrſhire from Paiſley to Kilmarnock, to the towns of Ayr and Irvine, and back to Kilmarnock and Tarbolton, returning again to Paiſley by Irvine and Beith, I made a few obſervations.

Firſt, I never ſaw a county or ſhire in Scotland where there was ſo little muir or waſte ground; the greater part being either incloſed, had been in tillage, or was in graſs.

Secondly, The roads for the moſt part very good, being chiefly turnpike, except from Paiſley to Stuarton, and from Irvine to Beith, which are in ſome parts very bad.

Thirdly, Although the moſt of the farms are incloſed with ditch and hedge, yet very few of them are fencible, the thorns being planted in the face of the ditch, very much ſtinted in the growth; many of them fogged or covered with moſs, which is a ſure ſign that the hedge is going back in the growth. There is no way of helping theſe hedges, but by cutting them over cloſe to the ground, making up a ſmall facing upon the outſide as high as the thorns, and one foot broad at the top; and as the thorns grow, to throw in more earth about the roots. This will give a new growth, and help to keep in the moiſ-

ture

ture in ſummer, and drain the water from the roots in winter. Water ſtanding in winter in the ditches, ruins the hedges altogether. But the moſt effectual way to make theſe fences good, is by facing up the ditches with ſtone three feet and a half high from the bottom of the ditch, which ought to be made a little deeper and wider before the ſtones are built; the mould taken out of the ditch, and thrown upon the top; then to plant the thorns upon the top about two feet from the edge of the ſtones. This, with digging for ſome years after being planted, will very ſoon make a good fence, and it will continue ſo, both to hold out and in.

I ſaw very few good fences in the whole county. Dr M'Readie of Peiſton had the beſt, and a few others whoſe names I did not know.

It is ſomewhat ſurprizing to ſee almoſt a whole county at ſo much expence for incloſing, and yet ſuffering it to go to ruin for want of taking proper care. Unleſs hedges are looked carefully after for the firſt five or ſix years after being planted, they might as well not be planted.

The fourth obſervation is, That a great many

many of the ridges, particularly near Kilmarnock, are by far too high raiſed, which makes the furrows very poor, and hurts the field very much when in graſs.

A field of ridges eighteen feet broad, with a moderate riſe, when the water furrows are all kept clean, will anſwer better both for corns and graſs, and produce greater crops than by having the ridges ſo very high: For when high, they can never reverſe the ridges, by making the crowns the furrows, and the furrows the crowns, unleſs they bury the whole manure, and bring up a new ſoil entirely; ſo that they may as well bring in a field from muir or waſte ground, as to attempt to alter the ridges ſuddenly. Whereas, when the ridges are of a moderate riſe, they can be altered without any damage to the ſoil. The great matter is, to keep the water furrows clear both in ſummer and winter; and then, although very great rains fall, the damage will not be great.

The fifth obſervation is, I obſerved them in the month of January laying on lime upon theſe high ridges, when in graſs, all wet, and in clods.

By this method they loſe a great part of the

the virtue of the lime, which, when ſo much wet, has not the ſame virtue as when dry. The froſt in that ſeaſon muſt hurt the lime very much; beſides, a great part, by having the ridges ſo very high, is waſhed away by the great rains. Whereas, were the lime put on in the month of July quite hot, after the firſt cutting of hay, the firſt ſhower would make it ſink into the roots of the graſs; ſo that one acre would be worth three in paſture, and would continue good paſture for many years. The hotter the lime is put upon the fallow, ſo much the better: For two bolls laid on hot will have as much effect as three or four bolls when wet and out of ſeaſon.

I ſaw no ſummer-fallow in Ayrſhire but one field, and even that was neglected to be water-furrowed. It was ruined by water ſtanding upon it. In a country ſuch as Ayrſhire, where ſo much rain falls, the fallow, after every day's plowing, ought to be water-furrowed in the evening.

Sixth obſervation. I was much ſurprized to ſee ſuch ſmall corn-yards in ſuch a fine country, and where there is ſo much graſs and

and lime. I was informed by Mr Foulis at Irvine, that there are not one thouſand bolls of wheat produced in all the ſhire of Ayr. Whereas, were they to take proper methods of cropping, having a regular rotation, with a fallow, in a few years Ayrſhire might perhaps produce fifty thouſand bolls or more yearly, and other corns in proportion.

To conclude. I muſt own there are few counties in Scotland, where ſuch rapid improvements could be made as in Ayrſhire, as they have ſo much incloſed, and in graſs, with great plenty of lime and coal near at hand, and good roads. In the courſe of ten years the produce might be ſix times what it is at preſent, if the whole county were to adopt an univerſal and regular courſe of cropping. Suppoſe the whole county were to begin and break up a tenth part of all their graſs grounds each year, and ſow with oats or lint, the old graſs grounds would produce very great crops.

The ſaid Mr Foulis in Irvine told me, that a few years ago ſome of Lord Eglinton's parks in old graſs were ſet for plowing at nine pounds per acre for each year; and the

 perſons

perſons that took them were gainers, although they were at the expence of the whole labour and ſeed.

The very produce of oats annually, if generally adopted, would be more than all the preſent produce of the different grains in the whole county; which would render importation from Ireland, or elſewhere, unneceſſary.

The ſame field the ſecond year, ſummer-fallowed, limed, and ſown with wheat, would produce an equal number of bolls of wheat that the preceding year produced of oats, and perhaps a third more, if ſeed time and harveſt were favourable.

I know ſome farmers will have three objections to this year's ſummer-fallow:

Firſt, That ſo much rain falls in this part of the country, that it prevents the good effects of fallow.

The ſecond is, That the ſecond year would produce, if ſown with oats, a better crop than the firſt year.

The third is, That it is a great hurt to break up old graſs, which is richer paſture than new graſs.

As to the firſt objection, There is no doubt

but

but wherever great rains fall, it puts a ſtop to the plowing for ſome time; for ground ought never to be plowed when wet.

There are two ways that, in ſome meaſure, might prevent the damage done by great rains.

The firſt is, By having the fallow early over, and the ground ſown before the rain ſets in. It is commonly known in that county what month the rain ſets in, and how long it commonly continues.

The ſecond method is, To endeavour to prevent the damage. It is certainly better to have all the fallow-plowing over early, and always to have the water-furrows clear, even in dry weather, ſo that the rain may not ſurpriſe the farmer. If the rain comes on when thus prepared, before ſown, the farmer's buſineſs is to wait with patience until the rain is over, and ſow the wheat, although late or early in the ſpring, when the ſeaſon is favourable, without plowing again. Be ſure, by all means, not to allow any water to ſtand in the furrow. Let the water-tracts be opened with a ſpade at the end of each furrow, if it cannot be done with the plough.

If

If a field be well plowed and ridged, ſo as to prevent the water from ſtanding, it will receive a great quantity of rain, without being ſo much hurt as one would imagine.

The anſwer to the ſecond objection is, That a ſecond crop of oats impoveriſhes or exhauſts the ſoil, more than a crop of wheat after fallow; of courſe, the field is not in that order for the ſucceeding crops as after a fallow; beſides, a good crop of wheat, in general, is equal in value to two crops of oats. The farmers in the carſe of Gowrie, who pay from thirty to fifty-five ſhillings each acre for rent, find it much for their intereſt to ſummer-fallow a ſixth part of their farms every year, after taking only one crop of oats from clover. Some of them have told me, they commonly have the ſixteenth return from the ſeed ſown after this fallow.

There is another great argument for ſowing wheat in a country ſubject to much rain, that it is the firſt grain commonly cut down, when early ſown, and requires to ſtand but a few days in the field after being cut down, before it is carried to the barn-yard. Nay, I have known wheat, when very ripe, cut down

down the one day, and carried to the barn-yard the next. The wheat crop will not exhauſt the land, if followed with a green crop.

It is not the wheat crop that ruins the land, ſo much as the injudicious method of taking two white crops in ſucceſſion; then, indeed, the ſoil will be very much exhauſted, and will take many years, and much expence, to bring it into the ſame order that it was before. This is a fault which many who reckon themſelves good farmers fall into.

In anſwer to the third objection, By breaking up old graſs, you obtain a treaſure for little expence; which enables the farmer to improve the moſt barren parts of his farm, affording him large ſums of money to purchaſe manure, and to defray the expences for men, cattle, &c. At the ſame time, the large quantities of ſtraw, when managed properly make large dunghills; this raiſes great crops of corn in other fields.

It is a very bad ſcheme, when old graſs is ſet for three white crops, two of oats and one of barley, allowing all the ſtraw to be carried off the farm. This exhauſts the farm very much;

much; and the graſs will not be ſo good as it was when broke up, perhaps for twenty years, when not dunged before being laid down with graſs ſeeds. Whereas, by following the method now propoſed, of not taking two white crops running, without a fallow or green crop intervening, and dunging to the green crop, the ſame field that was broke up from old graſs is laid down as rich, if not richer than it was at firſt; ſo that, in a few years the paſture will be as good as ever, if not better, and the hay crops extraordinary good.

Thus this very field, beſides the large ſums of money got for the different crops, will maintain double the number of cattle it did before. And if you take into this account the profits ariſing from the dung the ſtraw makes, which improves other fields, it may be averred as a fact, that it maintains more than ten times the number of cattle it did before, and the field not exhauſted. The following extract from Marſhal's Rural Economy, p. 132, will ſhew this.

" Minute 73. February 10. It ſeems to be " a received idea among the Norfolk far-

" mers,

" mers, that the ſtraw which is eaten by
" cattle, is in a manner waſted as to manure.
" Mr S. I remember, as an argument in fa-
" four of his plan of fattening pigs looſe in
" the open yard, ſaid, What a rare parcel of
" muck they make, compared with what
" neat beaſts would have made from the
" ſame ſtraw? A parcel of lean hungry
" ſtock, ſays he, come into a yard, and eat
" up all the ſtraw. See there lies a bundle
" of ſtraw as big as a man can carry.

" Mr B. the other day, intimated the ſame
" idea. However, on putting the queſtion,
" he acknowledged, that a little dung and a
" little trodden ſtraw do well together.

" In the north of England, the farmers
" make their cattle eat almoſt every blade of
" their ſtraw, ſo that they have ſcarcely any
" left to litter their ſtalls with. Give a York-
" ſhire and a Norfolk farmer equal quanti-
" ties of ſtraw, the Yorkſhireman would
" keep more cattle, and carry out his dung
" at a leſs expence; whilſt the Norfolkman
" would make more muck. But quere,
" Whether is the manure better or worſe?
" and quere, Which of the two, upon the
" whole, is the better management?

" Much,

" Much, perhaps, may depend on the
" quality of the foil to be manured. A large
" quantity of long dung would, perhaps, for
" ſtiff cold land be better than a ſmaller
" quantity of ſhort. But perhaps, for a
" loamy ſoil, ſhort dung is the beſt."

To avoid two extremes, I would recommend one half of the ſtraw to be eaten, and the other uſed for litter.

From all this it may be obſerved, that thoſe who keep old graſs too long are hurting themſelves, and hindering that great increaſe of produce, which would prevent importation.

Let any intelligent farmer make a calculation of the profits upon the different crops in a moderate way, he will ſoon ſee, that the old graſs, broke up for five years, will produce more profit during the five years in tillage, and one or two in hay, than is generally made upon four farms of the ſame extent of ground wholly in tillage; yea, in many places, than upon ten farms, for the ſame number of years.

But to return. The method of cropping propoſed is, the fourth year after wheat, a green crop of beans, or mixture of peas, in ſome

ſome places a part of turnips or potatoes; the whole dung made upon the farm laid upon either of theſe crops; the whole ſummer dung plowed in in autumn; the dung made in the winter and ſpring alſo plowed in, whenever the ſeaſon anſwers. The beans and peaſe to be ſown as early as the ſeaſon will permit; only, be ſure not to plow or ſow wet. Plant likewiſe the potatoes early; put the rank dung above them, which will prevent the froſt from hurting them. The leſs the dung is rotted, either for the potatoes, beans, peaſe, or turnip, ſo much the better. The rank dung rotting in the ground with theſe green crops, meliorates and enriches the ſoil very much, and renders it in fine order for barley and graſs ſeeds the following year, particularly if the ground is cold and wet.

There is this advantage in laying on the dung to theſe crops, that the barley can be ſown early in the ſpring, when the ſeaſon anſwers, which makes an early harveſt; the grain is better in quality, having the heat of the ſun in its ſtrength when ripening, and runs leſs riſk from the great rains.

There is another advantage ariſing from laying on the dung to theſe crops, that it is

better intermixed with the ſoil, which anſwers better for the graſs ſeeds, than when the dung is laid on for the barley. Likewiſe not having to dung for the barley, you can be more certain of embracing a good ſeaſon of ſowing whenever it offers, whether early or late. Some years the time being conſumed in driving out dung for the barley, the proper ſeaſon of ſowing is loſt, which both hurts the barley crop, and graſs ſeeds ſown.

Theſe crops, when dunged and properly dreſt, the ſeaſon being favourable, are often of more value than a wheat crop. I have known ſixteen bolls of clean beans upon each acre, by following the above method. I had upon an average, fifty bolls of potatoes upon each acre, every boll weighing forty ſtone Dutch weight, which is above ſix hundred weight Engliſh; and I have raiſed ſome years eighty bolls.

The fifth year, I would propoſe barley and graſs ſeeds, as the ſoil, by the above method of cropping is both well pulveriſed, and rich with lime and dung. The barley crop, if the ſeaſon is favourable may be expected to be very great, as neither the lime or dung is exhauſted; being only the third year ſince limed

limed to the fallow, and the ſecond after being dunged: So that it may with propriety be ſaid, this field is in the higheſt culture for raiſing a very large crop of hay for one year, and good paſture for four years after; which in whole is ten years. And we ſhould then proceed to repeat the ſame courſe as before, the firſt year oats, and ſo on.

If what is propoſed was reduced to practice, the corn crops would not only be very conſiderably increaſed to what they are at preſent, but the crop of hay and paſture would be increaſed in proportion; and by theſe means conſiderable quantities of muir and waſte ground could be brought in at a ſmall expence.

What is here ſaid, with reſpect to improvements in Ayrſhire, will anſwer in part for moſt of the counties or ſhires in Britain.

I have not had an opportunity to ſee a county or ſhire in Scotland ſo much adapted for making ſuch a rapid improvement of increaſe in produce as Ayrſhire, as ſaid before, having ſo much incloſed and in graſs, great plenty of lime and coals to be purchaſed at a cheap rate, good roads, and the ſoil benefited by lime.

Yet

Yet the improvements in Ayrſhire at preſent are very far from being compleat. They may be ſaid to be only blocked out, in order to pave the way for a more compleat ſyſtem. And, unleſs they alter the preſent method of cropping, they will be in danger of loſing a great part of the expence already incurred; and the farms will be little better than when they began to attempt improvements, if not in a worſe condition.

I am certain, if the whole ſhire were to adopt the plan propoſed, of breaking up a tenth part of all the graſs new and old every year for ten years to come, and only take the four crops mentioned, and the ſecond year in fallow, the value of the whole produce of corns and graſs, in ten years, would be ſix times what it is at preſent, and the ſoil every year richer, as long as the ſchemes propoſed were continued.

What proves this, and puts it beyond all doubt, is the practice in the Carſe of Gowrie. The farmers there, ſince they altered their courſe of cropping, own, that they make as much profit in one year, as they did before in five. They now divide their farms into ſix equal parts, firſt fallow, then wheat, third year,

year, beans and peaſe mixed; fourth, barley ſown with red clover; fifth, clover or hay; ſixth year, oats; then fallow, and ſo on as before.

The beſt farms have, when the ſeaſon is favourable, above ten bolls each acre upon the whole farm, of all theſe four average crops. This at the average price of the four grains, at ſixteen ſhillings per boll, is eight pounds each acre. I knew one farmer have 70 acres in hay, of which he had about 500 ſtones upon each acre, 22 lb. Engliſh to the ſtone, about 5 ton weight each acre. This was the greateſt crop of hay I ever knew, either in England or Scotland upon ſuch a large field. Having that quantity upon one acre or two laboured with the ſpade, is not ſo much when extraordinarily dunged. The fallow with lime and dung raiſes uncommonly great crops of clover. The ſecond cutting the ſame year is often greater than the firſt.

In whatever country there is as much graſs and lime near at hand, as in Ayrſhire, at a cheap rate, the advantages will be ſimilar. Every ſoil does not anſwer equally well with lime; ſome light ſoils anſwer better with

marl,

marl. But every ſoil will anſwer with a part in fallow, in corns, and in graſs.

Every farmer, in every ſituation, wherever the ground is arable, adopting theſe ſchemes, will find them turn out greatly for his advantage; although not with equal ſucceſs, as every ſituation is not equally favourable, nor every ſoil equally rich.

When at Dr M'Redie's houſe at Pearſton, I was expreſſing my ſentiments on the uſefulneſs of whins as food for cattle; having a nouriſhing, warming, healthful quality above moſt vegetables in preſent uſe for the food of cattle, from the quantity of bitumen in their compoſition. I have often thought, before converſing with the Doctor, that they might be uſeful for mankind, but durſt not venture to affirm this from want of experience. I was agreeably ſurpriſed when the Doctor told me, that he often recommends them to poor people in conſumptions, &c. His method is firſt bruiſing and pouring boiling water upon them, letting them ſtand for ſome hours; then pouring off the water, and mixing the juice with warm ſweet milk. This has had wonderful effects in curing ma-

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ny of his patients. I have been induced to mention this, becauſe it is a fact not generally known; and perhaps the publiſhing it may be beneficial to mankind.

Many advantages would accrue to the weſt of Scotland if theſe plans were adopted. In Glaſgow, Paiſley, and the neighbouring towns, conſiderable manufactories are now eſtabliſhed of cottons, lawns, and cambrics, which require finer yarn than can be ſpun from Britiſh flax. This trade might be eſtabliſhed upon a ſolid footing, if part of the raw materials could be produced in this country as good, and cheaper than what are now purchaſed from France or Flanders. The trade might by this means be increaſed, and the manufacturers would be able to ſell their goods upon equal terms with foreigners, if not lower.

The women of that country now ſpin very fine linen yarn. It would therefore be of very great importance to the whole of Britain, that they could get into the proper methods of raiſing fine flax.

The ſchemes mentioned will anſwer in every part of Britain; yet there are ſome ſituations

ations and ſoils more adapted to the raiſing of fine flax than others. In every place where there are large quantities of old paſture graſs, we may be almoſt certain of raiſing a weighty crop of fine flax.

The moſt eligible method is to ſummer-fallow it, and then ſow with flax; or one crop of oats may be firſt taken, leaving a long ſtubble, which ſhould be plowed down immediately after the oats is cut down. Part might be plowed before they are carried off the field. This would, in part, ſerve for dung. It ſhould then be ſummer-fallowed before ſown with flax. Old graſs would not require any dung, being for the moſt part very rich. If any dung was given, it ſhould be only a top dreſſing, with either lint-ſeed or rape, duſt, ſalt, ſoot, pigeon, ſheep, or goat dung, wood, or good peat aſhes, harrowed in with the crop when ſown.

All dry graſs ground would be greatly improved by flooding with water every year in autumn and ſpring. This would not only increaſe the quantity and quality of graſs, but would be an excellent preparation for a flax crop, which would both increaſe the weight,

weight, and make it much finer. The ſummer fallow ought to be plowed five or ſix times in the ſummer, and but very little harrowed. The ſeed fur given in the autumn ſhould be well water-furrowed. This will keep in the moiſture better than plowing in the ſpring, and be much more certain of a good crop: For in ſome years the drought ſets in after the ſpring plowing, which ruins the crop. The ſeed ſhould be ſown as early as the ſeaſon will permit.

It may be objected, that the ground being ſo rich, the flax will be in danger of lodging and rotting, eſpecially in the weſt country, where they have ſo much rain.

In anſwer to this I would obſerve, That whenever this happens to be the caſe, the proper remedy is to pull the flax, if there be no appearance of fair weather, and ſpread it regularly upon the ground where it grows, but rather thick, and turn it every day. If the rain continues, it will be well watered in a few weeks, more regularly and better than if it had been put into the water, and the flax whiter. If, indeed, I was certain of the rain continuing, I would never chuſe to water

lint any other way. It is both ſofter and ſtronger than that which is put into the water; is leſs expence and riſk; equally good for both ſpinning and weaving, and much eaſier bleached.

But if the ſeed be ſown early in the ſpring, it will be ready for pulling before the rain ſets in. The ground not being plowed in the ſpring, will alſo give the lint a firmer hold in the ground, and therefore will not be ſo apt to lodge. Eight pecks of ſeed will be ſufficient for each acre. If the ſeaſon is favourable, an extraordinary crop may be expected, more ſo than if the fallow had been after any other crop.

If the proprietor chooſes to ſummer-fallow the firſt year, the ground will be rather richer than after oats. The firſt fur ſhould be not above two and a half inches deep, which rots the graſs ſooner than when deep plowed, and requires leſs harrowing to reduce it.

A crop of flax dreſſed in this manner may be equal in value to two or three crops of good wheat.

This is another inducement to ſummer-fallow; for, if the farmer loſes the wheat ſeaſon by rain, he may be certain of getting the

the flax ſeaſon, if he gives the ſeed fur before winter, not having to plow in the ſpring, but only to embrace the time whenever the ſeaſon offers beſt for ſowing.

I am of opinion, that very great quantities of lint are deſtroyed at the lint mills; the ſtroke of the cutchin is too violent, which cuts off great part of the lint. If flax was rich, and properly watered, I would approve both of rollers and beaters going by water. Firſt roll the lint, and then beat it with the ſtamp, then clean it with the hand, cutch, and ſtock. The Dutch have no lint mills, yet their flax is very clean.

When lint is good, and well-watered, it is very eaſy cleaned; but when hungry, and ill watered, it is very difficult. This leads us to obſerve the cauſe that the moſt part of the lint in Scotland is ſo bad in quality, and very difficult both to clean and bleach. This is owing to the poverty of the lint, being for the moſt part ſown upon poor ground, and not properly prepared. Lint requires to be ſown in the very richeſt ſoils, and after proper culture. When ſown upon good ground and clean, no crop pays better; but when ſown upon poor ground and dirty, no crop

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is leſs profitable; for the expence is often more than the whole value of the crop.

As there is ſo much graſs all around Glaſgow, Hamilton, Mairns, Dunlop, &c. if the gentlemen and farmers there, and in the different ſhires, would break up all their old graſs, they would not only have much more graſs and corns than at preſent, but very large quantities of flax of the beſt kind, by following the plan propoſed; and not only in that part of the country, but over all Britain, wherever the ſituation is ſimilar. And this ſo far from hurting any part of the country, would greatly improve the whole; as one acre ſown after this manner would produce as much fine flax as four or ſix will do, in the ordinary way of ſowing and dreſſing.

The flax of the growth in the weſt ſells, in the Glaſgow market, from fourteen ſhillings to one pound ten ſhillings per ſtone, each ſtone 22 lb. Engliſh, according to the fineneſs. I have had myſelf forty ſtones upon each acre. But ground dreſſed in the manner propoſed may reaſonably be ſuppoſed to produce a weighty crop in ordinary ſeaſons, and with more certainty, and leſs expence for weeding, not being ſo liable to be affect-

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ed with the dry weather, nor ſo much hurt by the rains as the flax ſown in the ordinary way.

An acre of flax, when ſown after old graſs, and ſummer-fallowed, dunged with a top dreſſing, in ordinary ſeaſons would be in value from L. 30, to L. 50, ſome years more. Forty ſtones of lint would be, at thirty ſhillings, L. 60, the expence for ſeed and labour to be deducted. Whereas, the average value of lint in general ſown at preſent in this country will not amount to L. 8; although in ſome places, when ſown after graſs, the value will be L. 30. Yet the great quantity which is ſown upon poor ground, and full of weeds, reduces the average value.

Indeed, the only way to render flax a profitable article, both to the farmer and the manufacturer, is to follow the Dutch manner of eſtabliſhing flax boors, who purchaſe the flax from the farmer at ſo much per acre when growing, and the buyer is at the whole expence of manufacturing, from pulling till dreſſed into flax. The boor would give according to the value of the flax when growing; and having no other employment but to attend upon the crop, when pulling, watering,

tering, graſſing, and dreſſing, would take care that all theſe operations were conducted in the beſt manner. At the ſame time, the farmer would be a gainer, having no riſk to run after the flax was ſold. His great care would be to raiſe the weightieſt crops, when he would always be ſure of a purchaſer, which would not hinder his other operations upon his farm.

How often do we ſee a fine crop of flax loſt entirely by not being pulled in proper time; lying too long in the water, till half rotted, or rotted upon the graſs; and after all, the one half of what remains deſtroyed at the lint mill?

It would be highly advantageous to the whole country, and manufacturers, that a number of ſkillful perſons were ſettled in every part of the country, where much lint is ſown. Some ought to be brought from Flanders, and ſhould be allowed ſalaries for ſome years, in order to inſtruct others.

The following extract, taken from the Intereſt of Scotland conſidered, printed in the year 1733, wrote by the late Provoſt Lindſay of Edinburgh, will tend to elucidate what is before ſaid.

"Our

" Our preſent way of managing home-
" grown flax is ſo bad, that it were better
" for our linen-manufacture, if we raiſed
" none at all: For every fault, every failure
" in the flax, is an error in the firſt concoc-
" tion, not to be cured afterwards by any
" ſkill or labour. Yarn ſpun of unripe flax
" will never make good cloth; and where it
" is mixed with other yarn, the cloth is diſ-
" liklied. Flax ſpoiled or diſcoloured in the
" watering, cannot be brought to that full
" white required in fine cloth, unleſs the
" cloth be ſo much thinned and emptied,
" that it is good for nothing; and where it
" is mixed with good yarn, the cloth can ne-
" ver be of the ſame colour. Unleſs we are
" at pains to reform our way of managing
" our lint, we had better purchaſe it entirely
" from the Baltic, Holland and Flanders.
" But as we have been long in the practice
" of raiſing of flax, we muſt go on; and if
" we can be at a little more trouble, and ſome
" ſmall expence, we ſhall reap from the
" ſame ground a third part at leaſt more flax
" than we do at preſent, and that too 30 per
" cent. better in its quality. I ſhall therefore
" give a ſhort account of the method prac-
" tiſed

" tiſed by the Flanders flax-dreſſer, who was
" ſome time ago brought over by the truſtees
" upon public encouragement, to teach us
" their way of preparing their ground, ſow-
" ing of flax-ſeed, raiſing, pulling, watering,
" and dreſſing their flax, and compare it
" with our own.

" The beſt ſoil for fine flax is the tender
" and yellow black mould, or any light ſoil
" mixt with loam and a little ſand, that will
" not bind with any ſudden drought. The
" lower the ground lies, and the flatter it is,
" the better, providing it be dry enough to
" be ſown in the proper ſeaſon. It ſhould
" be fallowed, at leaſt two winters and a
" ſummer. The firſt plowing ſhould be as
" deep as the ſoil will admit of, and thereaf-
" ter plowed with an ebb furrow, ſo often as
" the appearance of weeds makes it neceſſa-
" ry. In October or November, before the
" ground is to be ſown, it ought to be well
" dunged, and as well dreſſed at ſowing as
" garden mould; and two buſhels of good
" ſeed is ſufficient to ſow one acre of ground
" thus prepared. We ſow commonly four
" buſhels, and ſometimes a hogſhead on one
" acre, becauſe our ground is not prepared

" as

" as it ought to be. The effect of this is, if
" our ſeed be good, all comes up, and half
" of it is undergrowth; this unripe lint is
" rotten in the watering, before the reſt is
" ready, and the whole is ſpoiled by it.

" In ground thus prepared, the weeds are
" ſo very few, that one hand will clean as
" much lint ground of weeds in a day, as
" eight can do in our preſent way; and this
" is a conſiderable article of expence ſaved.

" When his flax is fully ripe, and not till
" then, he pulls it; and if any unripe ſtalks
" appear, he carefully ſeparates them from
" the reſt, and waters them by themſelves.
" When his lint is pulled, he ties it up in
" ſmall bundles or ſheaves, no bigger than
" one can graſp about with his two hands,
" and ties them looſely with a few ſtalks of
" itſelf, a little below the ſeed, and then ſets
" them up on end, two and two, like ſtooks
" of corn, in the air and ſun, until it be
" well dried; and then ſtrips the ſeed-boll
" from it as we do. He then ties two and
" two of his ſheaves together, the ſeed end
" of the one always to the root-end of the
" other.

" Wherever he can find flat lying ground,

" under level to any running water, there
" he digs his ponds for watering his lint, ſo
" large as the ground will allow, and near to
" three feet in depth. When his ponds are
" filled from the rivulet with water, he puts
" in his lint until the pond is full, but does
" not ſink it. The reaſon why he ties the ſeed-
" end of one ſheaf to the root-end of the o-
" ther is, that the roots being heavier would
" ſink in the water, and the ſeed-end would
" be entirely out of the water; but when
" thus balanced, the lint being much of the
" ſame ſpecific gravity with the water, it is
" juſt immerſed, and no more, and never
" comes near the ground or the mud. He
" turns it in the water every day, and if the
" weather is very hot, twice a day. He tries
" when it is enough watered, by breaking a
" few ſtalks; and if the boon breaks freely,
" and parts eaſily with the flax, then he takes
" it out, and carries it to a clear running
" ſtream, and waſhes it very well from all
" its filth and naſtineſs, and then ſpreads
" it upon graſs (very thin) as we do. If the
" water appear to be very much diſcoloured
" in the pond, before his lint is ſufficiently
" made,

" made, he lets off the water, waſhes his
" lint, and then fills his pond from the run-
" ning brook, and puts it in again until it be
" enough done. When his firſt parcel is laid
" on the graſs, he puts another in the ſame
" pond, and continues ſo to water his lint
" ſo long as the ſeaſon is warm enough. He
" turns his lint on the graſs once a-day, and
" keeps it on the graſs as long as the dews
" fall, which give the lint a fine colour,
" without hurting it, and makes the yarn
" ſpun of it waſh and empty eaſily without
" waſting or weakening it; and the cloth
" made of it comes ſoon to a fine colour,
" without being thinned in the leaſt.

" So much of his lint as he intends for his
" beſt ſeed, he builds up in a ſtack like corn,
" after it is thoroughly win, with the bolls
" on it, and ſtrips it at ſowing time; and in
" the month of May thereafter, puts it into
" the water, and follows the ſame method
" with that watered in the autumn. So
" much of his lint as remains on his hand
" undreſſed after the middle of March, when
" the dews begin to fall, he lays out again
" upon the graſs for a good colour, and al-
" ways

" ways takes up his lint from the grafs in
" dry weather, and about mid-day.

" N. B. Care muft be taken in rainy wea-
" ther, that the lint receive no damage, by
" rotting on the grafs; but gentle fhowers
" are as good as dew.

" Our prefent way is, to fow our lint on
" any ground, which puts us to a great ex-
" pence to weed it. We fow it thick, (as we
" muft do in ordinary ground), whereby
" one half of it is ripe before the other is
" ready: By this means, the unripe feed be-
" ing mixt with the full ripe, fpoils the
" whole; and the unripe lint is rotten in the
" water, before the other is ready.

" In the Weft, where the fineft fpinning
" is, the people are rivetted in a moft perni-
" cious conceit, that unripe lint makes the
" fineft flax; and therefore pull all their lint,
" when the bloffom falls. This kind of lint
" heckles away almoft to nothing; and is,
" indeed, in appearance very fine. But then
" it has no fubftance, and the yarn fpun of
" it is always weak and ouzy. It waftes
" much in the wafhing, and cloth made of it
" grows as thin as a cob-web in the bleach-
" ing,

" ing, before it can be brought to a full co-
" lour."

After all that has been ſaid concerning the raiſing of flax, it muſt be owned, that it is an exhauſting crop, more eſpecially if the ſeed is allowed to ripen before pulled. Even clover, if the ſeed is allowed to ripen, is an exhauſting crop. Therefore flax ought never to be ſown, but upon ground that is very rich, and properly prepared by a ſummer-fallow, and followed with dung to a green crop, as is propoſed in the plan.

The ground plowed immediately after the flax is pulled, or the lint crop ſown with clover, any of theſe methods will prevent the bad effects of a flax crop.

The beſt crops of clover ever I had were ſown with the lint crop. It muſt likewiſe be obſerved, that when it is pulled green, it is not near ſo hurtful. Whenever the ſeed is formed is the proper time for pulling, if you want fine flax. To leave it in the ground until it is too dry, is equally pernicious with the contrary extreme of pulling it in the bloom.

Virgil ſays, " A crop of lint, or oats, or
" poppy,

" poppy, impoverifhes the foil. However, " thefe crops are lefs fevere, when the land " is fallowed before and after them; and " when the farmer is not afhamed to lay " plenty of rich dung upon the land, if natu- " rally poor; and nafty afhes upon the land, " if worn out with cropping."

Whenever any farmer has an inclination to fave lint-feed for fowing the following year, the moft proper method for raifing good feed is, to fow the lint, after the fummer-fallow, in drills, the lines nine inches or a foot diftant, which will allow the lint to be hand-howed. This will make it grow ftronger, and branch out confiderably at the head; and likewife make the lintfeed bolls larger; confequently the lint-feed will be very good.

The lint is not fo apt to lodge when fowed in drills, as when fown broad-caft. The ftalk is confiderably firmer and groffer, which enables it to ftand the ftrefs of the weather better. Two pecks of lintfeed will be fufficient to fow an acre in drills.

I have fowed it with the drill barrow that fows the beans; all the alteration I made was a new roller put upon the axle-tree, made on purpofe

purpoſe to allow the lint ſeed only to drop. It can be made to ſow thicker or thinner at pleaſure, by altering the bruſh, either lifting it up or down.

One man can ſow three acres each day with this barrow. And if ſowed in the manner propoſed with the drill machine, (vide National Improvements), by a man and horſe, can do more than double.

When ſown with the drill-barrow, the man would need three poles or garden lines to direct him to ſow the drills ſtraight. The ground ſhould be completely harrowed before ſowing, and only rolled after being ſowed, as the harrow would be apt to take the ſeed out of the line of the drills.

The advantages of ſowing lint in this manner would be, that the farmer could always depend, in ordinary ſeaſons, on having good ſeed, equal, if not ſuperior to any that comes from abroad.

The beſt method would be to dry the lint in the ſtooks, with the ſeed upon it, and to ſtack it up all winter, and threſh it out in the ſpring; then to water the flax in the ſummer, which would make ſtrong coarſe-

lint,

lint, ſuch as that which comes from Riga. The farmer often loſes his crop of lint by waiting for the ripening of the ſeed; by which means the lint is not only conſiderably hurt, but makes it ſo late of pulling, that it often interferes with the corn harveſt, and is frequently neglected through the hurry of other buſineſs. And as the water becomes colder at the end of the ſeaſon, it is not ſo fit for the purpoſe as when the weather is warmer. By this ſcheme, there would be more ſeed, and better, upon one acre, than two or three acres ſown in the broad-caſt.

If this came to be univerſally practiſed, it would only be neceſſary to change the ſeed. That which grew upon ſtrong or damp ſoils ſhould be ſowed upon light and dry ſoils. The ſeed that grew upon light and dry ſoils ſhould be ſowed upon ſtrong and moiſt ſoils. The greater the diſtance between the place of growth, and that of ſowing, the better.

By following this practice, the ſeed would continue good for many years; which would, in a great meaſure, prevent the neceſſity of bringing ſo much ſeed from abroad. The Dutch are raiſing the price of lintſeed every year, which is a diſcouragement to the ſowing

ing of flax. I remember when the Dutch lintſeed was from eighteen to twenty-four guilders per hogſhead, and was reckoned very high when it came to four and twenty guilders per hogſhead; and now they have got it up to forty two guilders, and we cannot ſay how far they may raiſe it in this progreſſive way.

Riga lintſeed is better for propagating the lint ſeed than the Dutch; for it anſwers better the ſecond year than the firſt. The Dutch always make it a rule to ſow the Riga themſelves, and ſend the produce of their own ſeed to Britain and Ireland.

OBSERVATIONS

ON THE

STATE AND SITUATION

OF SOME PARTS IN THE

NORTH OF SCOTLAND,

WITH RESPECT TO AGRICULTURE.

With ſome Hints for the Improvement of theſe Places.

In a Journey from Edinburgh to Fort William, and from thence to Fort Auguſtus and Ruthven of Badenoch.

OBSERVATIONS, &c.

BEING appointed by Captain Henry Rudyerd chief engineer for Scotland, by order of his Grace the Duke of Richmond, Maſter-general of the honourable Board of Ordnance, to value ſome lands belonging to his Grace the Duke of Gordon at Fort William, which the Board propoſed to purchaſe; in my journey, I made a few curſory obſervations on the ſoil and nature of the country, with a view to the improvements that might be made upon it; and which I here preſent the reader, as being of opinion, that they may tend to the advancement of that moſt uſeful of all arts, agriculture. Though, I muſt own them to be neither ſo full nor ſo accurate as I could have wiſhed, having no better opportunity of examining moſt of the grounds, than by viewing them as I paſſed along the road.

It

It is my ordinary amuſement, when riding through the country, to conſider what improvements could be made in this or that part of it. And, even ſuppoſing I may be often wrong in my conjectures, yet, if any one accuſtom himſelf in this way, he may frequently throw out hints that may be uſeful both to the proprietor and the public.

Therefore it is hoped, the reader will forgive any ideas that are not ſo proper. All that can be ſaid is, that they are well intended both for the good of proprietors and the public in general.

In the beginning of October, I ſet out from Edinburgh to Stirling. Although there are many farms much improved upon this road, yet there is a great want of uniformity of cropping and incloſing.

Few fences are made as they ought to be, with ſunk fence faced with ſtones, and a thorn hedge planted upon the top, which I eſteem to be beſt of all. Only a few farmers having a regular rotation of corn and graſs crops, with a fallow; ſome having too much graſs, others too little.

Although this has the name of an improved country,

country, yet much might be done to better purpoſe, by draining and incloſing, with a regular ſcheme of cropping; having neither too much nor too little in graſs and in fallow; a number of ſmall villages, each houſe having only a large garden of two and a half acres, leſs or more; part in clover, to be laboured with the ſpade, and ſtripes of planting in many parts; which would tend to warm the ground when in graſs, and prevent the winds from ſhaking the corns ſo much as they often do when expoſed.

From Stirling to Down, the country is in the ordinary way of cropping, the moſt part rather late this ſeaſon.

Blair Drummond, the ſon of the late Lord Kaimes, is doing great things, in order to carry off, by means of water, a large moſs, conſiſting of many hundred acres, commonly called Flanders Moſs, ſaid to be owing to a Roman legion who cut down the wood that was then growing there.

It is evident, that it was once all wood; for there have been axes found deep in the moſs, and in many places, bridges made of wood laid acroſs, to paſs from one place to

another

another above the clay, as well as large trees, which indeed are to be found in every moſs. All below is a very fine ſtrong clay: And, in order to run away the moſs, Blair Drummond has erected a large water-wheel upon Teith river, ten feet broad, and betwixt thirty and forty feet high, with buckets in the inſide of the rim of the wheel, that diſcharges forty tuns of water in one minute, into a wooden ciſtern at the top; from which wooden pipes eighteen inches in diameter conduct the water about fifteen hundred yards, where it runs into a canal, which conducts it to different parts of the moſs, to carry it away. The expence of the wheel and pipes was above two thouſand pounds. The pipes are all made of foreign wood three inches thick, bound with iron hoops within a few yards of one another. The moſs is of a light ſpungy nature, a great part being no more than long graſs fallen down and rotting. I never was upon the moſs to ſee it, but ſhould think that part of it might be trenched in with and below the clay, which would tend to keep the clay open.

Any man that can clean a part of the moſs has

has ſo many years free of rent, if I rightly remember, it is eight years free, and ſo much an acre every year after for rent. There is a number of families ſettled there, who go under the name of the moſs lairds.

There is rather too much of the incloſures at Blair Drummond in graſs, which is not ſo much for the intereſt of the proprietor, as Lord Kaimes ſays in his Gentleman Farmer, p. 148.

The moſs that is caſt aſhore by the tides on the ſides of the river Forth, would anſwer very well to be mixt with dung, as it is impregnated with ſalt water, or might be put upon paſture ground by itſelf.

From Down to Callender has the appearance of a light dry ſoil, very much adapted for graſs; which would produce very weighty crops of hay when under proper management, if incloſed, as formerly propoſed, with a ſunk fence, and thorns upon the top, which would make a moſt beautiful country. The thorns would anſwer very well upon this ſoil.

I was much ſurpriſed to ſee ſuch poor crops upon ſuch good land in appearance, as the ſeaſon was favourable for this kind of

 ſoil.

ſoil. The reaſon of theſe poor crops I ſuppoſed to be, that the land was exhauſted by conſtant cropping in corns, without regular rotation of corn and graſs, and improperly manured.

If the one half of this country was in ſown graſs, the produce would be double to what it is at preſent; which would ſave both ſeed and labour for the land at preſent in corns.

This part of the country would anſwer ſurpriſingly well with the ſpade culture in large gardens, as propoſed. All kind of trees would thrive very well here, fruit trees not excepted.

From Callender to Lochearnhead, on both ſides of the loch of Lubnich, five miles in length, moſtly all graſs. Very few houſes. The ground on both ſides of the loch lies warm and dry. The ſoil on the north ſide in appearance very good, fit to carry good crops of corns and graſs; would pay very well for the expence of labouring with the ſpade. And, as this glen is warm and well ſheltered from moſt winds, a number of houſes might be built, having only two and a half acres for a garden, to be laboured wholly with the ſpade, with a part every

year

year ſown with red clover. A few ſtripes of planting would both beautify and add to the natural warmneſs of the place. Fruit trees would anſwer very well. It is naturally pleaſant with the loch in the middle of the glen. A number of houſes feued out with gardens would add much to its beauty, as well as to the profit of the proprietor.

I ſhall here remark once for all, that the richeſt ſoil is often to be found at the bottom of hills. You will ſcarce find it otherwiſe in any place; and if ſo, here is the place for labouring with the ſpade to profit.

I am informed, that there is an appearance of lead mines upon the ſouth ſide of the loch, in Mr M'Nab of M'Nab's ground. Whereever theſe ſigns are, it is not a bad method to make ſeveral cuts acroſs the face of the hill, and let the waters run in them, which will ſoon make them deep; by this means they may be often diſcovered at little expence.

This glen has the appearance of a good ſoil, that a great many parts of it will pay for the expence of labouring with the ſpade. And as there is lime at a little diſtance, if limed and ſown with graſs ſeeds, after taking two

or

or three crops, would make extraordinary good paſture. And when thus digging with the ſpade, ſome mines might accidentally be found out.

The expence of the ſpade culture upon a ſloping bank may be done for the one half of digging upon level ground; and ſome particular parts might be planted with fruit trees before they were ſown into graſs.

As there is a great number of places at the foot of many hills, the ſituation of which is much the ſame as this, lying warm and dry, the ſoil good and ſheltered from moſt winds, they may be improved in the above manner.

I was informed, that one of the proprietors propoſes to drain a part of the loch, which will do conſiderably more than pay the expence.

From Lochearnhead to Tyndrum there is a large quantity of fine meadow ground lying on each ſide of the water of Dochart, from Loch-Tay to Tyndrum; a great part of which ſtands in much need of being drained. The river firſt ſtraightened as much as poſſible, than deepened, beginning at Killearn, and working as far up as Tyndrum. A great part

part of Loch Dochart might be drained by deepening the river. After this was done, or rather in doing of which, the whole banks upon each ſide of the river Dochart might be ſloped with a gentle declivity, and covered over with green turf or ſwaird; the earth taken from the water-ſide, and carried forty or fifty feet back, which would help to form a ſloping bank to prevent the water running upon the meadow.

The beſt way for conſtructing this bank is, firſt to mark out the breadth and height of the banks and ditch you propoſe to make; then pare all the turff off; this lay to one ſide, to be put upon the bank when finiſhed; then throw up a ditch in the inſide, from the water, as large as you want to raiſe the bank, to prevent the water from overflowing, which ditch in the inſide will help to drain the meadows at the ſame time; the bank round upon the top, and ſloped on both ſides. Then cover the whole bank neatly over with the turf, beat it down with the back of the ſpade, ſlope the ditch in the inſide, and ſow it with graſs ſeed. This will prevent the meadow from being covered with ſand, which is often the

the caſe in time of flood. This bank may be made for two ſhillings the ſix yards, ſuppoſing it to be ten or twelve feet broad at bottom, and five feet high, or perhaps cheaper. The height and breadth of the bank depends upon the height that the water riſes at the higheſt flood; the level of which ſhould be taken before the banks are made.

Theſe meadows, when large, ought to be divided by a bank running acroſs the breadth of the field, made in the ſame manner as the other, by a ditch thrown out in the under ſide, divided into ten or twenty acres.

At the foot of each incloſure, next the water, place a flood-gate or ſluice to draw up and down at pleaſure; by which means little ſand would come in. At every time the incloſure was overflowed, a fine rich mould would be left upon the ſurface, and enrich it very much, and every year be increaſing in richneſs.

If this was done properly, there are few ſpots in Scotland that would produce better crops of hay or paſture. The meadows being naturally of a good ſoil, and the water of a very enriching quality, after being a number of

years

years in grafs, it would furprife every one to fee what great crops of corns they would produce; and lint in particular could be flooded when three or four inches long, which would benefit the crop amazingly.

The advantages arifing from this embankment would be twenty times above the expence.

Every place by river fides in the like fituation might be greatly improved by thefe means, wherever the fituation of the ground would allow to bank out the water and let it overflow at pleafure in time of floods. Though the ground was ever fo poor, even nothing but gravel or fand, yet in a courfe of years it would become a rich foil; as every flood leaves a fediment upon the furface. What are all your rich carfe clays but mud or fediment fettled in former ages in this way?

There is a very great difference between this and water running every flood over a meadow, when it only leaves fand or gravel. If in tillage, it carries away the foil; if in grafs, it hurts the pafture; the fine mould going all down the river. But wherever a field is banked, fo as to keep the water from running, and left open at the foot, then the water

water ſtands dead; the fine mould runs up, but not ſand, and ſettles upon the ſurface, which, in a courſe of years, makes it a very rich ſoil.

In ſome ſituations it would be worth the proprietors conſideration to run a dam acroſs the river at the foot of a large flat field, made up of looſe ſtones, in order to raiſe the water to make it run back. Or, perhaps, it might be cheaper to cut a ſmall canal a good way above, to conduct the water to the underpart of a large flat piece of ground, which could be let in and out at pleaſure. This would anſwer very well in time of great drought. It is only rare ſituations will admit of this.

There is an amazing quantity of fine ground ruined by river-ſides being neglected, which, if attended to, might be made the richeſt in Britain, and dunged for nothing, being water-fed, by following the above plan.

It is wrong to bank out the water, and not allow it to come in at the foot at pleaſure.

Wherever you have a command of muddy water to overflow the whole field, there is no need

need for any dung; this being ſufficient of itſelf to make a very poor field rich.

There are places without number in many parts of the hills, where the water could not only be made very uſeful for the face of the hills, but likewiſe conducted acroſs to water the plains, to be let on and off at pleaſure.

The advantages ariſing from making the proper uſe of water, when properly conducted in every ſituation, are almoſt incredible. Theſe hints may ſuffice at preſent: Only, let every perſon conſider what improvements can be made by water upon his own grounds.

From Tyndrum to King's-houſe, and down Glencoe. This very long tract of great and awful mountains, lying all contiguous to one another, yet disjoined by glens, appear like ſo many mole-heaps lying all cloſe to one another, of different heights and largeneſs; with very few or no houſes alongſt the road, which makes it look diſmal and awful.

In viewing theſe very great hills, I was more and more convinced of the truth of what I ſaid in National Improvements, viz. That all the mountains and hills were thrown up by earthquakes, by means of fire and

water meeting together in the bowels of the earth.

It is probable it was at the univerſal deluge, when the whole world was convulſed, and the internal parts of it ſeparated in ſuch a manner, that not only earthquakes, raiſed by fire and water in the bowels of the earth, have an eaſy communication from one quarter of it to another, but likewiſe vapours ariſing both from fire and water.

This may be one reaſon, and I think a ſtrong one, why the inhabitants ſince the flood do not live ſo long as thoſe before it, that the whole world being convulſed, left gulfs and many great cavities in the earth, being all rent, which contract and contain many hurtful and noxious vapours; and theſe emitted through the crevices into the air make it very unwholeſome for the inhabitants: And theſe ſulphureous vapours often raiſe tempeſts in the air.

This appears very plain, for the largeſt and higheſt of theſe hills are all ſhattered and full of rents from top to bottom, the ſtones being disjoined from one another; and the higher the hills, the more ſhattered and open they are.

I never was ſo ſenſible of any thing of this kind as in the preſent journey, going over the Black Mount, (which is well named, the faces of the rocks there look awful and black, as if they had been covered with ſmoke.) Being before a great rain, which was only coming on, I was very ſenſible of a ſtrong, diſagreeable, ſulphureous ſmell in the air, which I imagined proceeded from theſe black rocks not far diſtant.

Whoever contemplates with attention the preſent appearance of the globe, will be unavoidably allured to the concluſion, that the ſurface of the earth muſt have undergone a very conſiderable change; and he will allow it probable, that this change has taken place in conſequence of internal fires, producing partial earthquakes, at various periods, and more eſpecially at the deluge, when an univerſal convulſion took place.

We may be allowed to ſuppoſe, that the whole earth is full of conſiderable chaſms; and that thoſe parts which were formerly the ſurface, are now buried below, and that which was below is now uppermoſt.

When the whole world was convulſed by earthquakes, as the bottom of the ſea was

nearest the centre, this being the weakest part of the globe, would of necessity give way first; and, of course, whatever substance was at the bottom would form the summits of the mountains which were then raised. And that this conversion of the bed of the ocean into the summits of mountains has actually taken place, is abundantly proved by the relicts of marine animals, which have been found on mountains of the greatest height.

It is certain, that there is a subterraneous fire in every portion of the globe; and that it is owing to the goodness of God, it does not break forth and consume the whole; which the divine records assure us will one day happen, perhaps sooner than the generality of mankind imagine.

Some object, that fire cannot burn without air, which is a fact. But when it is considered, that the whole globe is full of rents, more particularly its rocky parts, a very small quantity of air will make a fire burn moderately, and continue many ages without going into flame. The more any fire is confined, so much is the degree of heat increased. Our ideas of the degrees of heat in subterraneous fires are at best but very imperfect.

All

All that we can do, is to judge by the effects we ſee. Theſe indeed are very great. Every kind of ſubſtance is calcined by the ſubterraneous fire.

It is ſuppoſed, that all metals are formed by the vapours ariſing therefrom, which tinge the mineral waters. Theſe, wherever they run, convert the earth into the different metals, often mixed together in the ſtate they are found in the bowels of the earth.

What makes it probable, that all minerals are formed by the vapours ariſing from the internal fire, is, that as often as you melt any metal, its weight is diminiſhed; and, if the fire is continued for any length of time, the greateſt part will evaporate. You may collect ſome metallic calces at the top of the furnace, although very high, where much metal is melted.

Since writing the foregoing treatiſe, I have read Dr Hutton's Theory of the Earth. Several of the Doctor's arguments prove what is here alledged, and likewiſe what is ſaid in National Improvements, pages 1ſt, 2d, 4th, 5th, 6th, 17th, and 18th. His reaſoning is, in general, ingenious; but I cannot admit the following concluſion which he draws;

"But

" But if the ſucceſſion of worlds is eſtabliſh-
" ed in the ſyſtem of nature, it is in vain to
" look for any thing higher in the origin of
" the earth. The reſult, therefore, of our
" preſent inquiry is, That we find no veſtige
" of a beginning, no proſpect of an end."

From this concluſion I beg leave to diſſent. For it is expreſsly declared by divine Wiſdom which cannot err, That the world was created by the almighty power of God in ſix days. The ſcriptures alſo aſſert, that this earth will be wholly deſtroyed by fire.

Many of the Doctor's arguments, though employed by him for a different purpoſe, may be brought with equal propriety to prove that there has been an univerſal deluge, and that the whole world was convulſed at that period. And indeed, this fact throws great light on his theory.

He often mentions the collection of materials from ſea and land animals, as in p. 80.
" At a groſs computation, there may per-
" haps be a fourth part of our ſolid land,
" which is compoſed from the matter that
" had belonged to theſe animals."

From the creation of the world to the deluge, about 1650 years elapſed; during which period,

period, it is reaſonable to ſuppoſe, that very great quantities of materials were collected in the bottom of the ſea. This is agreeable to what the Doctor ſays, p. 13. " The general " amount of our reaſoning is this, That nine " tenths perhaps, or ninety-nine hundredths " of this earth, ſo far as we ſee, have been " formed by natural operations of the globe, " in collecting looſe materials, and depoſit- " ing them at the bottom of the ſea; conſo- " lidating thoſe collections in various de- " grees; and either elevating thoſe conſoli- " dated maſſes above the level on which they " were formed, or lowering the level of that " ſea."

Page 17. " The ſtrata, formed at the bot- " tom of the ſea, are to be conſidered as ha- " ving been conſolidated either by aqueous " ſolution and cryſtalliſation, or by the effect " of heat and fuſion."

P. 54. " We now deſire to know, how far " thoſe internal operations of the globe, by " which ſolidity and ſtability are procured to " the beds of looſe materials, may have been " alſo employed in raiſing up a continent of " land, to remain above the ſurface of the ſea.

" There

" There is nothing ſo proper for the erec-
" tion of land above the level of the ocean as
" an expanſive power of an infinite force, ap-
" plied directly under materials in the bot-
" tom of the ſea, under a maſs that is proper
" for the formation of land when thus erect-
" ed."

The following circumſtances may reaſonably be ſuppoſed to have taken place, both before and after the univerſal deluge, all of which, we apprehend, are implied in the Doctor's theory, although not expreſſed in this manner.

Firſt, That before the deluge, the various parts of the earth were conſolidated, either by aqueous ſolution and chryſtalliſation, or by means of heat and fuſion; which, in a courſe of years, would make very conſiderable alterations upon the internal ſtructure of the earth.

Secondly, When the flood overflowed the whole earth, and the fountains of the great deep were broke open, the fire and water meeting together, would occaſion an univerſal convulſion of nature. At which time, all the materials which were at the bottom of

the

the ſea were thrown up, and the mountains and hills were formed.

As we are informed by the ſcripture records, " That all the high hills that were un-
" der the whole heavens were covered with
" water," we may conclude, that the convulſion was univerſal. The effects of which are evidently ſeen over the whole univerſe to this day. And although we had no authentic record of the deluge, there is not a more natural way of accounting for the preſent ſituation of the globe.

The following extracts will, in part, ſupport theſe obſervations.

Theory of the Earth, page 58. " We are
" now to conclude, that the land on which
" we dwell had been elevated from a lower
" ſituation, by the ſame agent which had
" been employed in conſolidating the ſtrata,
" in giving them ſtability, and preparing
" them for the purpoſe of the living world.
" This agent is matter extracted from ex-
" treme heat, and expanded with amazing
" force. If this has been the caſe, it will be
" reaſonable to expect, that ſome of the ex-
" panded matter might be found condenced

" in the bodies which have been heated by
" that igneous vapour; and that matter fo-
" reign to the ſtrata may have been thus in-
" troduced into the fractures and ſeparations
" of thoſe indurated maſſes."

Page 57. " The ſtrata of the globe are ac-
" tually found in every poſſible poſition. For
" from horizontal they are frequently found
" vertical; from continuous, they are bro-
" ken and ſeparated in every poſſible direc-
" tion; and from a plane, they are bent and
" doubled. It is impoſſible that they could
" have originally been formed by the known
" laws of nature, in their preſent ſtate and
" poſition; and the power that has been ne-
" ceſſarily required for their change, has not
" been inferior to that which might have
" been required for their elevation from the
" place in which they had been formed."

Page 55. " It is a truth unqueſtionable,
" that what had been originally at the bottom
" of the ſea, is at preſent the higheſt of our
" land."

Page 76. " Thus we have ſufficient reaſon
" to believe, that, in knowing the conſtruc-
" tion of the land in Europe, we know the
" conſtitution

" conſtitution of the land in every part of the
" globe."

Theſe, and other obſervations to the ſame purport, which occur in the Doctor's treatiſe, prove, that the materials at the bottom of the ſea were firſt conſolidated, and were afterwards thrown up by the expanſive power of heat. There is no period at which an univerſal convulſion could take place ſo probably as at the deluge. From this account we may eaſily conceive, how the great revolutions have taken place upon the ſurface of the earth, without ſuppoſing that there was another world before this, or that another ſhall ſucceed it.

There is very little improvement can be made on this long tract of mountains, but to ſtudy the natural ſituations. See National Improvements, page 169. The moſt that can be done is by means of very large incloſures; underſtocking; draining all moraſs grounds in every part of the hill; turning the water acroſs the face of it, to run zigzag, which would not only deſtroy the heath, but likewiſe bring up a green ſwaird; liming ſome of the beſt ſpots, in order to deſtroy the

heath

heath and increaſe paſture; paring and burning ſome parts; ſpreading the aſhes, and ſowing graſs without a crop, to increaſe the paſture; erecting ſome houſes with large gardens, in the warm dry ſituations. Where the ſoil is good, about two and a half acres to every houſe, to be laboured only with the ſpade. A number of theſe houſes might be built in the glens or vallies, where there is good ſhelter.

There is certainly a great number of mines in theſe hills, either of lead or copper. The great matter is how to find them out. Viewing the water tracks after thunder ſhowers, or very heavy rains, may ſometimes be the means to find them out. Cutting water-tracks acroſs the face of the hills may ſometimes make diſcoveries. Wherever there is ſpar, which is a hard variegated ſubſtance, there are mines not far off. This may ſometimes lead perſons to trace where the vein of ore is. But the mines are moſt frequently found out by accident. It is ſaid, when there is much ſnow upon the ground, wherever the mines are the ſnow melts firſt.

Although theſe hills are very diſmal and barren

barren to look at, yet the paſture, in the very pooreſt parts may be much improved, by ſome of theſe methods; and planting would tend much to warm the ground.

I was ſurpriſed to ſee ſo little planting in this part of the country, where it would thrive ſo well, having ſo much rain. Sowing the ſeed of different trees upon the face of the barren bare rocks might in time turn to a wood.

A good thorn hedge is better ſhelter from the wind than a ſtone fence, as it divides the blaſt; whereas, the wind ſtriking againſt a ſtone wall rebounds and comes over with violence on the other ſide. So, great plantations of wood, would afford more warmth and ſhelter to a whole country-ſide, than the bare hills. There are a great many lochs among theſe hills, which might be eaſily drained, or, at leaſt, partly drained; whereby great quantities of good land might be gained, either for hay or paſture. If in a low ſituation, would produce great crops of corn for two years; and then it might be ſown with graſs.

In ſhort, the moſt barren hill, or muir, might be much improved by incloſing, drain-

ing

ing firſt, then watering, planting for ſhelter, giving the whole, or beſt parts, a top-dreſſing, either with hot lime, marl, moſs, peat aſhes, or the ſtuff taken from the moraſs grounds. After this, to ſhut up the field for twelve months, not letting a beaſt paſture upon it. Never after overſtocked.

The improvements that can be made upon many hills, theſe in particular, by means of draining and watering in times of drought, and other ſeaſons, are almoſt incredible, and can be done at a ſmall expence, having ſo many different ways to ſet on and off the water. The height being ſo great could lead on the water to a great diſtance, and then to run along the hill zig-zag; always taking care not to let the water run rapidly, nor too long in one place, but ſhifting it from one place to another, and led on to where there was a plain; and even there, only to let it in at the foot of the field, ſo as to let the water run back over the whole at pleaſure. This is only taking the advantage of the natural ſituation of every place, whether for paſture, hay, or corn.

For this reaſon, there are more improvements

ments can be made, by means of water upon the hills, than in the low country, the ſides of many rivers excepted.

I was very ſorry to be informed, that in this part of the country, and Argyleſhire, they were depopulating the farms much, by throwing the moſt of them into large ſheep walks. The ſheep are very good in their place, but the beſt improvements may be overdone.

It is certainly very wrong in the proprietors to depopulate the country, they ought rather to make it their ſtudy to deviſe ſuch ſchemes as might make each of their tenants live more comfortably, and at the ſame time increaſe their number. This they might do by erecting a great number of ſmall villages, in every corner of the country moſt adapted for them; either the proprietors building the houſes themſelves, or feuing out two and a half acres for each houſe, to be laboured only with the ſpade, which would encourage manufacturers to ſettle there. The manufacturers would encourage agriculture, by taking the produce from the farmer, and the farmer would encourage manufacturers to ſettle

wherever

wherever they can have plenty of provifions at a cheap rate.

Lint would anfwer very well, even better than corn in this country, having fo much rain; but it would need to be pulled in ten days after the bloom is off, not waiting for the feed ripening; which would make the flax crop much finer, and run lefs rifk from the great rains which fall here.

I do aver, that the fame farm which is wholly in pafture, in many fituations will maintain more than double the number of fheep or cattle, by having the half or third of what is prefently in pafture in corn crops, having a regular rotation of corn and fown grafs; never having of what is in tillage above the third or one half at moft in corns; other parts in fown grafs, for hay and pafture.

By having fo little in corn, it would be manured extraordinarily, more fo wherever there is lime, marl, fea fhells, fea wreck, mofs, or peat afhes. This would produce very great crops, both of corn and grafs.

When the farm is rich with manure, it makes an early harveft, as admitting of being fown early; and early corns being fown, fuch

ſuch as wheat, winter-barley ſown in autumn, Lincolnſhire barley in March, early Dutch or Eſſex oats in April, early peas, turnip, and potatoes.

Indeed, every ſtore-farmer ought to have part of his farm in corns, for provender, to prevent his ſheep and cattle from dying in time of great ſtorms.

Even near the higheſt hills, there are glens or vallies in which corn would grow very well, and likewiſe hay, as ſaid before. The ſoil in theſe places is often very rich, which would anſwer better to be laboured with the ſpade than the plough.

A number of houſes might be built in theſe places. Wherever there is a good muir lying low, and well ſheltered, or could be made ſo by incloſing and planting, having a good ſwaird and dry bottom, theſe might be feued out for houſes when near water.

Fort-William is a neat, dry, healthy place, commanded by Captain Cochran, who is an excellent officer, and keeps the garriſon in very good order. This fort has contributed in part to the civiliſation of this country; where any perſon may travel as ſafe as in the low country, or in England.

The town, formerly called Maryſburgh, now called Gordonſburgh, lies to the weſtward of the fort, along the loch ſide, which is an arm of the ſea, running above twenty miles up the country.

It is ſaid to be warm in winter, the ſnow not lying long there, ſurrounded on the weſt, ſouth, and north, with very high hills.

Benevifs, lying a little to the ſouth-eaſt, is ſaid to be the higheſt hill in Scotland, being fourteen hundred and twenty-four yards above the level of the ſea.

Gordonſburgh is a neat country town, having many good houſes, and ſeveral merchants in a thriving way.

If the fiſheries increaſe, it may be of great ſervice, as the herrings come up as far as the town. There is likewiſe plenty of ſalmon, and ſome ſea fiſh, with great plenty of wild fowl.

This may come to be a place of trade in time, and would be very much ſo, if the cut between Inverneſs and this place was made navigable, as propoſed by Mr Knox, which he particularly deſcribes in one of his tours. I think it might be eaſily done.

I am informed, that there have been pieces

of

of rich lead ore found at Glenevis, which is not above two miles diſtant. The great number of high hills ſurrounding this place, makes it very probable there may be many mines not far diſtant. The eaſy acceſs by ſea to bring coals, ought to excite the attention of ſome company to make trial. In the year 1745, men of war came up to the fort.

Lochlochy might be made navigable to this place, being five or ſix miles in length, and very deep, which never freezes in winter. If that was done, it would be navigable twelve or fifteen miles farther in the country, in the way to Fort Auguſtus, where there are high hills on every ſide.

There is almoſt a certainty of a great many mines in this tract; therefore the gentlemen proprietors ſhould join altogether in one, to get ſome proper perſons to ſearch: And, if they ſucceeded, it would go a great length to pay a part of the expence incurred by opening this navigation.

Indeed, the whole tract, where the cut is propoſed to be made, from Inverneſs to Fort William, and ten miles below, has high hills on each ſide.

There are few places where there are ſo many

many appearances of mines as in this country; and, if once found out, the land carriage would be very ſmall, perhaps more ſo than in any other place in Britain, as ſhipping could come with coals and wood, and in return, carry away the lead or copper, or perhaps ſilver.

I am informed that there is a mine of black lead found out at Glengarrie, which is in the tract of this propoſed navigation, within a few miles of Lochlochy. A very little expence would join Lochlochy and the loch at Glengarrie in one.

Gordonſburgh might be made a very good place for manufacturers to ſettle in, if the muirs and farms in the neighbourhood were improved, and quantities of lint ſown.

Though this country ſeems very much adapted for the production of flax, I was informed that there was very little linen yarn ſpun here, only woolen.

It ought to be the buſineſs of gentlemen proprietors to encourage both linen and woolen yarn being ſpun, which is the firſt ſtep towards ſettling manufactures. They ought to give a number of wheels gratis to the tenants, and likewiſe annual premiums to the girls

girls who ſpun the beſt yarn. This might raiſe an emulation, and produce very good effects. The tenants in Athol pay moſt of their rents with the linen yarn that they ſpin, and raiſe a great part of the lint they uſe themſelves.

After having put a value on theſe lands at Fort William, along with Angus M'Donell, Eſq; of Achtrichitan, I had occaſion to ride from Fort William through Lochaber to Fort Auguſtus, and from thence to Ruthven of Badenoch.

I was very agreeably ſurpriſed to find ſuch a vaſt extent of good ground, both in Lochaber and Badenoch, belonging to his Grace the Duke of Gordon, which is capable of a very great improvement upon a ſmall expence.

I will venture to affirm, that the muirs in Lochaber had the appearance to me when riding along the public road, to be equally good with the beſt in Scotland, if not ſuperior to any I ever ſaw. What renders theſe muirs ſo valuable is, that moſt of them have a very cloſe ſwaird of heath and graſs, and a pretty level ſurface or gentle declivity; which, when pared and burnt, might pro-

duce

duce ſuch a vaſt quantity of aſhes, as would raiſe eight or ten bolls of barley or oats per acre, or perhaps more when the ſeaſon was favourable.

Secondly, That the moſt of the grounds having ſuch a declivity, might be very eaſily drained by ditches made for incloſing, or by covered drains. This is the firſt thing that ought to be done, before any other improvement is attempted.

" A little to the eaſtward of Fort William " is the remains of the caſtle of Inverlochy. " It appears from hiſtory, that it was antient- " ly a place of conſiderable note, a reſort of " French and Spaniards, probably to pur- " chaſe fiſh, for which it was a kind of em- " poreum, patricularly for ſalmon. (I hope " it may be ſo ſtill.) But the place is ſtill " more noted for its being a reſidence of " kings, and where the memorable league, " offenſive and defenſive, is recorded to have " been ſigned between Charlemain and A- " chaius King of Scotland in 791."

When, upon the firſt ſight of this muir, I conceived ſuch a good opinion of the ſoil, I did not, at that time know what is ſaid above, until I read it in Mr Knox's Tour through

through the Highlands of Scotland in 1786. This account confirms me in the good opinion that I then had, and ſtill have, of what great improvements might be made. It is very reaſonable to ſuppoſe, that this being the ſeat of the kings of Scotland, a great part of what we now ſee muirs, were then in corns and graſs, greatly improved, and a good ſoil, otherwiſe they would not have taken up their reſidence in this place.

The ſoil and ſituation being good, warm, healthy, and eaſy communication by water, this, in proceſs of time, may come to be a place of ſome conſequence, as it lies well for dipping deep in the fiſhing trade.

If the muirs were once incloſed with plantations of wood, and improved, it would be very pleaſant, healthful, warm, and plenty of proviſions at a cheap rate, which would invite ſtrangers from different quarters to make it their reſidence for ſummer and winter.

In a ſituation like this, the air is undoubtedly more ſalubrious in the ſummer-time, than any foreign country that tender people can go to. In ſummer, plenty of goat milk, fiſhing and fowling. In winter warmer than

in

in moſt places in Scotland, which produces early crops of every thing both in the garden and field. The potatoes at Fort William were the beſt, and higheſt flavoured, I have eat any where this ſeaſon, the mutton alſo was uncommonly good.

From theſe conſiderations, the feuing out a great part of the muirs might turn to a conſiderable annual revenue. The incloſing with a ditch ſix feet wide, three deep, and three feet built above the ſurface, with a row of thorns planted on the top, two feet back, could be done at one ſhilling each ſix yards. At this rate, an hundred acres would coſt L.25; if a ſquare field 400 acres, L.50:2; 562, L.60, and ſo on in proportion. See National Improvements, p. 252.

Wherever there is ſo cloſe a ſwaird of heath and graſs, as in the muirs in Lochaber, the following method makes one of the beſt of fences at the leaſt expence. Raiſe the ſods nine inches or a foot ſquare, with theſe build a dyke on the ſurface of the ground, with the heath or graſs ſide outmoſt four feet high, caſt a ditch in the inſide, ſix feet wide, three deep, about five or ſix feet from the

the dyke; throw the mould that comes out of the ditch to the back of the dyke, plant the thorns upon the top of this, which is an immediate fence upon both ſides, whenever the ſods begin to moulder down, which may perhaps be in twenty years, if properly done. When decayed, face up the dyke with ſtones. By theſe means, a very large muir may be incloſed in a few months, at a ſmall expence; and whenever the hedge is a fence of itſelf, the ditch may be filled up.

Suppoſing the Duke of Gordon was to begin to incloſe a few fields next to Fort William; after draining, to pare and burn, and to ſow graſs ſeed with the firſt crop, either with lime, or without it; then to feu it out into ſmall incloſures, as is mentioned in National Improvements, pages 250, 339, and 390. If this was once begun on a regular plan, it would ſurpriſe his Grace how rapidly the feuing would go on. The feuers would build their own houſes being reſtricted to the plan laid down.

All the incloſures ought to be planted with thorns, as is mentioned in Eſſay ix. page 133, and more particularly, p. 138. The thorn

 hedges,

hedges, when fully grown, would in fome meafure alter the climate, by affording fuch bield or fhelter, as would make the grafs grounds confiderably warmer than they are at prefent. Stripes of planting would be very neceffary for accomplifhing this end.

I have no doubt, if once begun and planned out in regular villages, (fee page 393.) a great part of the muirs might be improved in a few years. There is no part in Scotland which I ever faw, more adapted for villages than this, having both lime and peat not far diftant; and the peat or turf would burn the lime without coal.

There is another method that would tend much to improve thefe muirs, firft, by inclofing them in large inclofures, the expence of which may be feen in page 252. After this, they may be drained with open or clofe drains. And it may be obferved, that no part of improvement will pay fo well as draining, even upon the pooreft ground. After it was drained, the ground might be limed upon the fwaird, which would deftroy the heath, bring up good pafture grafs, and raife the value of the lands to fix times what it is at prefent.

I muft here again expref my furprife, that

there

there is ſo little planting in Lochaber, where it is ſo much wanted, and where trees would thrive ſo well. The moſt advantageous for planting are larch, oak, and beech. Theſe may become the moſt general, if they are properly attended to, and in time may add greatly to the value of the country. Experience has proved, that the larch will grow in this, as well as in a much colder country, where no other timber can be raiſed. The oak will thrive in cold backward ſoils, and the beech anſwers in ſuch as are both dry and thin.

The third method propoſed for improving of muirs is perhaps the cheapeſt, and not the worſt, viz. firſt to incloſe and drain them thoroughly; after which, wherever there is a command of water, to let it run off and on upon the muirs. This will deſtroy the heath; in place of which good paſture graſs will be produced, and every year be growing richer, as long as the water is continued. This ſhould never be given over, but practiſed every year, making the water run only for a few days in one place, and then ſhifting it to another, till the whole field is gone over, and ſo to return again; that is to

ſay,

ſay, at certain ſeaſons, the water to be running either in one part or other of the field.

The fourth method propoſed for improving the muirs is, when they are incloſed, drained, and have got a green ſwaird, to lay over a coat of black free moſs, or hot lime, or both, upon the ſurface, ſo as to cover the whole graſs. This will have an amazing effect. Wherever the ſoil is dry and light, it will increaſe both the quantity and quality of the graſs very much. Sow a little white clover, and hay ſeeds, which will be of ſervice.

The laſt method propoſed is planting trees. This ought rather to be the firſt; but until ſuch time as the farm is incloſed, the young planting would be ruined by the cattle and wild beaſts.

Wherever fir, or any other wood grows naturally, without being planted, from the ſeeds blown by the wind from other plantations, this wood is far ſuperior in quality to that which has been tranſplanted.

I was informed by an Engliſh gentleman, who went to Fochabers on purpoſe to examine the quality of the woods lately purchaſed from the Duke of Gordon, that the

fir

fir wood there is equal, if not ſuperior in quality to any that grows in Europe, being moſtly all of red wood; and that there are a great number of fir trees there, that are fit to be maſts to the firſt rate men of war in Britain; and that the company would gain a profit of fifty thouſand pounds by the cutting of theſe woods; and that they had built ſeveral large veſſels wholly of fir, the greater part made from the branches of theſe plantations.

This proves to a demonſtration, that woods growing naturally, are far ſuperior in quality to thoſe that have been tranſplanted.

Therefore, every gentleman that propoſes to raiſe large plantations of wood, ought firſt to incloſe his ground, and then to plow it, if the ground would permit; after that to ſow the different ſeeds of trees. And although the wood ſhould grow very thick, they ought not to be thinned, but be allowed to thin themſelves, which makes the trees grow tall and ſtraight, and free of knots. If the ground will not admit of being plowed, ſowing the ſeeds will anſwer the ends propoſed.

Plowing the muirs, and then ſowing the ſeeds of different kinds of trees, would be better

better and cheaper than planting, in the remoteſt parts, leſs fit for being feued out. After the planting is ſomewhat grown up, plowing the muirs of Lochaber, and ſowing them afterwards with whins, would anſwer very well. I ſaw ſome growing pretty well near Fort-William, upon a ditch that had been neglected. They would anſwer very well after paring and burning, and taking two crops of corns, one of barley and another of oats, whin being ſown with barley or oats. I know no place in Scotland where whins would anſwer better than in Lochaber, being both dry, and warmer than many other parts of this country; more ſo if incloſed with plantations: Likewiſe having a great command of water for mills to bruiſe them, as is particularly mentioned in Eſſay xxii. page 287. I have not the ſmalleſt doubt but they would clear from L. 4, to L. 5, per acre, perhaps more.

The greateſt part of the hills I had acceſs to ſee in this journey, would be much improved by making the water run acroſs their face in a ſloping direction; not to have a ſudden declivity, but to return again zig-zag, till at the bottom of the hill. This would have

have one good effect, to water the whole face of the hill, which would not only deſtroy the heath, but enrich the ſoil in graſs.

This is perhaps alſo the cheapeſt and moſt certain way to find out where there are any mines, either of lead or copper.

The paſture upon the very top of Cariarich would be much improved by draining in this manner, and covering ſuch parts as are green with the moſs that is lying upon the top, which has the appearance of being much of the nature of rich black earth. Even ſome of the rocks that are flat, if covered with this moſs, and ſown with white clover, would make good paſture.

Moſt of the lands in Badenoch that I had an opportunity of ſeeing, along the ſide of the river Spey, ſeemed to be of a light ſoil particularly adapted for graſs. After being ſome years in graſs, they would produce great crops of corn. And it would tend greatly to the improvement of all theſe lands lying along the river-ſide, which, in time of floods, are wholly overflown by the water,

Firſt, That the bed of the river ſhould be made as ſtraight as poſſible.

Secondly, That the whole banks on both

ſides

ſides of the river ſhould be ſloped, then covered with green turf.

Thirdly, The whole land overflowed ſhould be banked in to prevent the water from running, but left open at the bottom, ſo as to allow the water to run up in time of floods, which would greatly enrich the land, either in corn or paſture.

It is wrong to incloſe too large a tract of land, without ſluices to let in the water at pleaſure. For when the water has to run a great way up, it is clear before it reaches the upper part of the field; and the more muddy the water is, it enriches the land the better.

When a very large field is banked in, it would be a great improvement to divide it into different incloſures of ten or twenty acres, with a bank to run acroſs the breadth of the whole, ſuch as Mr Hugh Tod has done at Ruthven; and immediately above the bank to have a ſluice to draw up and ſhut at pleaſure: By which means, it could let in the water, when flooded, into one field, and ſhut it out from another. This would make the water come in at the bottom of each field,

and

and prevent the ſand from running up; at the ſame time, the fine mud would run up, which enriches the ſoil every time it overflows the land. The ſluices could be made as ſtrong as any part of the bank next the river. See Eſſay x. page 149. Theſe ſluices could be made to ſhut of themſelves when the floods roſe very high, if it was found that they were in any danger.

There is no method of improvement ſo effectual as watering in this way; and the expence is not great, compared with the advantages ariſing from overflowing.

Draining firſt, and then watering, are two capital improvements, which, I may ſay, are much wanted in every part, both in the hilly parts and low country; as they are getting ſo much into ſheep.

Draining would improve the paſtures very much, greatly above the expence, or even the hopes of the farmer. The expence of open drains is very ſmall, and they can be eaſily made upon the tops of the higheſt mountains.

Wherever the water is confined below ground, it raiſes a coarſe ſour graſs, which,

 in

in place of fatening the ſheep, has a tendency to rot them.

It aſtoniſhed me in this journey, to ſee the very beſt parts of the ſoil and paſture, at the foot of many hills, all in bogs and moraſs; when, having ſo great a declivity, it could be eaſily made the richeſt part, either for paſture, hay or corns, at the ſmall expence of a few open drains, if the proprietor did not chuſe to be at the expence of covered drains; which, however, would not be great, having ſo many ſtones at hand. See page 171, Eſſay vii. p. 118.

It gave me great pleaſure to ſee the Rev. Dr M'Pherſon's ſmall farm at Dallahullie, whoſe improvements are as good and ſubſtantial as any in the low country. His ſunk fences, faced with ſtone, are uncommonly good. All that is wanted to make them equal with the beſt in Scotland, is, to plant them with thorns upon the top of five years old, which would grow very rapidly, the ſoil being very much adapted for them, and would alſo tend greatly to make each incloſure warmer.

The Doctor has a command of lime, which he burns with peats. He has likewiſe ſome

fine

fine meadows, which, if once drained, could be water-fed, and then would be very rich, either for hay or paſture.

He had a large ſtore, or paſture farm, which, he informed me, was greatly improved by underſtocking; ſo that now it maintains and fattens a vaſt number of cattle more than when he entered into poſſeſſion. He has now ſubſet it all at a conſiderably advanced rent.

The Doctor was the firſt I had occaſion to ſee ſince writing the National Improvements, who proved from his own experience and practice, upon a large paſture farm, what is ſaid in Eſſay xi. page 171, to be fact: "That "moſt of the paſture is overſtocked, eſpeci- "ally theſe wild grounds. I am fully con- "vinced, there would be much more paſture "upon any ground, more eſpecially upon "poor ground, where this method is follow- "ed by not overſtocking."

This was likewiſe confirmed by Captain John M'Pherſon at Ballachron, who informed me, that when he went firſt to his farm, he did not make above five pounds of his paſture yearly, and now, by underſtocking,

and

and keeping a herd to keep his neighbours cattle off, he makes a hundred a year.

It is a very great ſatisfaction to have what is written, proved from the practice of many eminent farmers. And, indeed, there is ſcarce one article of any conſequence in the whole book, but what has been proved by the experience of ſome practical farmer.

Here (I muſt own) I have not ſeen in any part of Scotland the methods recommended by me for banking in rivers reduced to practice, but in Badenoch on the river Spey. Firſt, by Mr M'Lean at Pitmain upon Mr M'Pherſon of Clunie's eſtate, who has banked a large tract of ground in a more ſubſtantial manner than the way I recommended, it being all built with ſtones at the back, in the form of a ſunk fence, two feet below the ground, to prevent the moles from making holes in it, and more than four feet above ground, with a large bank of earth cloſe to the ſtones, ſloping towards the water, and covered with a green ſwaird. This fence is a little way diſtant from the water which is very proper.

If this manner of embanking be not too

expenſive,

expenſive, it is certainly better than the way I propoſed. If Mr M'Lean was to ſtraighten the bed of the river a little, ſlope the banks, and cover them with green ſwaird, it would be more compleat, and unleſs he does this, it may in time undermine what he has done in ſome parts. Mr M'Lean has deepened the bed of the river below, which prevents it from overflowing ſo much as it did. This is of ſervice when in corns, but when in graſs is hurtful; as the more it overflows when in graſs, being made to run back, the more it enriches the ground. Banks acroſs with ſluices would have the ſame effect to ſave the corns.

Mr Hugh Tod has banked in the river Spey at Ruthven wholly with a bank of earth, round in the top, and ſloped on both ſides, covered with a green ſwaird, exactly the ſame as is recommended in page 154; which will anſwer the end propoſed very well, provided it be ſo high as to keep the water out; which does not exceed eighteen pence or two ſhillings at moſt each rood.

When the river is at its greateſt height, it would need to be carefully inſpected after every

very flood; and if any breach happens, it ought to be instantly repaired, otherwise a considerable part may give way. If this answers, which I think it may, being looked attentively after, it is much cheaper than Mr M'Lean's fence. Here the banks also require to be sloped, and the bed of the river straightened in the manner mentioned before, with a bulwark, or head projecting into the water, in some places, to alter the course of it, where it was encroaching.

I was shown at a distance, a large extent of ground, banked in the same manner as Mr Tod's, by Captain John M'Pherson, Ballachron; but was not upon the ground. I hope it answers the ends proposed.

In all these embankments, the water should be allowed, by means of a sluice, to come in at the foot, which would enrich the field every time the water came over it.

If sown with lint, it would be a great advantage to the crop, to let the water in after it was three or four inches high. In place of hurting, it might double the value.

Mr Hugh Tod's sunk fences at Ruthven are exactly upon the plan I have recommended,

ed, except that they are not planted with thorns.

Mr M'Lean's, vintner at Pitmain, ſtone fences appear to be equally good with Dr M'Pherſon's; the only defect is, the hedges are not planted upon the top as before mentioned. He has his farm in ſurpriſing good order, and a great part in graſs. It might paſs for a good farm in any part of the Lothians. I am informed he has been at a very great expence for draining, which is quite proper; yet there are ſome of his incloſures which would need to be better drained. It would tend much to the intereſt of the Duke of Gordon, and the country, that many would follow his example. Now after he has got ſo much of his farm into graſs, lime would ſtill greatly improve it, for corns and graſs, particularly what is in paſture, even the muirs above the road.

If the Duke of Gordon could, by any means, prevail on the greateſt part of his tenants to have the half of their farms in ſown graſs, with a regular rotation of crops of corn and graſs, it would be a very great advantage both for the proprietor and tenant, and would

would be the means, in a few years, to raiſe the rents conſiderably, and not hurt the tenant; as they would be better able to give an advanced rent, after being improved, than they are at preſent able to give the one half of the preſent rent.

A few premiums might be of great ſervice. See Eſſays vi. and vii.

Encourage labouring with the ſpade every where, more particularly at the foot of hills.

Encourage feuing in every corner of the eſtate in ſmall parcels, particularly muir ground, where the ſoil and ſituation is good, and near water. See the plan of villages in National Improvements.

Give long tacks to every farmer that is willing to improve, three nineteen years. Suppoſe the preſent rent ten ſhillings per acre, to riſe at the end of the firſt nineteen five ſhillings per acre, at the end of the ſecond five ſhillings more, which makes the rent double for the laſt nineteen years; and ſo on, in proportion to what the preſent rent of any farm may be. This will neither hurt proprietor nor tenant, but would tend to improve

prove the country very rapidly, and increaſe population.

By all means encourage good farmers, who are ſober and induſtrious, and are willing to follow a regular rotation of crops of corn and graſs, with a fallow. Although poor, they will ſoon become rich, if they perſevere in following the plan of huſbandry propoſed.

Give them graſs ſeeds gratis, upon well-prepared land.

To rent farms properly requires the greateſt ſkill in agriculture, and even natural ſagacity; the means of manure; the ſtate of the ſubject to be let; the markets; the induſtry of the farmers; and likewiſe their capacities as to ſkill in the buſineſs, and circumſtances with reſpect to their funds. Even the ſtate of firing and manufactures muſt be attended to. The rents muſt be adapted to the capacity of thoſe who occupy the farms; and the farms muſt be ſo modelled, as to have a proper proportion, if poſſible, of light and ſtrong land and graſs. The houſes to be centrical, with many other conſiderations.

The proprietor who can come neareſt to theſe rules, by properly accommodating his

tenants, will have the greateſt and beſt paid rents, and his eſtate firſt improved.

If other circumſtances are alike, whether the proprietor conducts his buſineſs perſonally, or by a ſteward, he muſt have what in Scotland is called a good ground-officer; a perſon who has ſkill, and knows the characters of the people of the country.

The following relation given by Mr Marſhall, is a proof how eaſily the moſt unpromiſing land may be improved, if a landlord acts with liberality, and a tenant poſſeſſes ingenuity and induſtry.

P. 367. " Minute 37. A principal part of " the heath land was laid to the farm of Mr " Prieſt, the young man above-mentioned; " and was let to him on the following " terms:

" Landlord agreed to raiſe fences, hang " gates, build a new barn upon a large ſcale, " make other alterations, and put the whole " of the buildings into thorough repair.

" The tenant agreed to marle twenty acres " every year, until the whole ſhould be " marled, at the rate of twenty cart loads an " acre.

" The rent agreed upon was this: Nothing

" until

" until it has been marled three years. The
" fourth year after marling, the rent to com-
" mence at three ſhillings an acre; at which
" to continue four years, and then, (namely,
" the eight year after being marled, to riſe
" to ſeven ſhillings and ſixpence an acre;
" and at this rent to remain until the expira-
" tion of the term of twenty-one years.

" It was alſo further agreed, that the te-
" nant ſhould be paid for the carriage of the
" materials of the new barn; but ſhould do
" that for the repairs and alterations gratis;
" as alſo for the ſubſequent repairs during the
" term. Alſo, that the tenant ſhould pay
" half the expence of workmen's wages for
" ſubſequent repairs; provided that ſuch
" moiety do not exceed five pounds in any
" one year.

" This was a liberal agreement on the part
" of the landlord; and, on a curſory view,
" may ſeem to give extravagant encourage-
" ment to the tenant. The following calcu-
" lation, however, will ſhew, that, in the
" end, the plan will turn out highly advan-
" tageous to the landlord.

" Suppoſe, for the ſake of calculation, the
" quantity of heath land let to this tenant,

" to

" to be exactly three hundred acres; and
" that these three hundred acres are divided
" into thirty inclosures of ten acres each;
" with a public road, of a drift way, between
" each line of inclosures. This is sufficient-
" ly near, if not exactly the fact upon Fell-
" brig-heath.

" In this case, every inclosure required to
" be fenced on three sides.

" Ten acres contain one thousand six hun-
" dred statute rods. The square root of one
" thousand six hundred is forty; consequent-
" ly, each inclosure, supposing them to be
" exactly square, required one hundred and
" twenty statute rods of fencing.

" The price given for ditching, planting
" the quick, and hedging, was eighteen
" pence each long rod, of seven yards. An
" hundred and twenty statute rods contain
" about

" 95 long rods, which, at 18d. is	L.7	2	6
" 45,000 quicksets, at 3s. 6d.—— 15s. 9d.			
" —— Furze-seed, 4s. 3d.	1	0	0
	L.8	2	6

" For

" For fencing 30 inclosures at L. 8 : 2 6 " each, reckon	L. 250	0	0
" —— 50 gates, with posts, irons " and hanging - -	50	0	0
" —— The barn (very spacious) " suppose, - -	200	0	0
" —— Additions, alterations, and " repairs - -	100	0	0
	L. 600	0	0
" —— Compound interest on this " sum, in 21 yearly payments, " at 4 per cent.	700	0	0
	L. 1300	0	0

" The rents to be received, during the " term, supposing twenty acres to be marled " yearly, would be these :

1 year,

1 year	0	0	0	Forward	153	0	0
2 —	0	0	0	12 year	49	10	0
3 —	0	0	0	13 —	57	0	0
4 —	3	0	0	14 —	64	10	0
5 —	6	0	0	15 —	72	0	0
6 —	9	0	0	16 —	79	10	0
7 —	12	0	0	17 —	87	0	0
8 —	19	10	0	18 —	94	10	0
9 —	27	0	0	19 —	99	0	0
10 —	34	10	0	20 —	103	10	0
11 —	42	0	0	21 —	108	0	0
L.	153	0	0	L.	967	10	0

" As the compound intereſt of
" the above receipts ſet down, 232 10 0

L. 1200 0 0

" Thus it appears, from this calculation, " that on the ſuppoſition of the articles of " agreement being ſtrictly adhered to, the " landlord will be paying, at the expiration " of the term, one hundred pounds as the " purchaſe-money of three hundred acres of " improved land, worth from ten to fifteen " ſhillings an acre; the principal part of this " allotment being a good loam, lying on the " deſirable

" desirable subsoil, an absorbent brick
" earth.

" But the fact is, and was probably fore-
" seen, that the tenant, instead of marling
" twenty acres annually, according to the
" letter of the agreement, marled, I think he
" told me, upwards of one hundred the first
" year, and has now nearly finished the
" whole.

" Therefore, supposing the original six
" hundred pounds, and the first seven years
" interest, to have been taken up, the land-
" lord would, at the end of the term, have
" cleared off the incumbrance, and have
" found some hundred pounds in his pocket,
" beside the fee-simple of one hundred and
" fifty to two hundred pounds a-year, from
" this allotment only; beside the advantages
" arising from the remainder of the heath,
" and the inclosure of the common field; and
" besides having done away a nuisance, and
" planted industry and plenty upon an almost
" useless waste: and this, too, without ren-
" dering himself odious, or his tenants mi-
" serable. Improvements like this are real,
" and bring a permanent increase to the rent-
" roll of an estate."

These

These obſervations have been lengthened out longer than was at firſt intended; which prevents me from making remarks on other parts of the country through which I travelled.

The hints that are already given may be reduced to practice with great ſucceſs in Athol, both on the hills, and by the ſides of the rivers.

There is one remark I would make, that Athol is a warmer climate than the grounds farther north, the country being populous, the ſoil good, and more of it improved.

This country would anſwer very well with the ſpade culture; eſpecially ſuch parts in Athol, Breadalbane, and Strathbran, where the ſoil is good to near the top of the hills.

The ſame obſervations will apply with reſpect to Fyfe; from Perth to the Queensferry, where there are very little ſubſtantial improvements going on by incloſing, draining, ſummer-fallowing, and liming, and a regular rotation of crops of corn and graſs.

It is very much to the diſgrace of the proprietors and farmers upon that road, that there is ſo little done in improving their grounds; having lime and coals both at a very

ry ſhort diſtance, and at a cheap rate. They would be the better of having ſome ſpirited farmers to ſet them an example of a regular and ſteady method of improving their grounds.

There are few ſituations in any country, but where ſome of theſe obſervations may be very uſeful, and eaſily reduced to practice.

I ſhall conclude, by relating ſome inſtances of the good effects of flooding, and the extraordinary crops produced by means of water.

Firſt, It is univerſally known what aſtoniſhing crops were produced in Egypt, by the overflowing of the river Nile only once a-year.

Though little or no rain falls upon this country, yet its fertility in former ages is ſaid to have been inconceivable; no leſs than one hundred fold every year. The river left a rich ſlime upon the ground, after its annual overflowing; which not only fertilized the ſoil, but was of ſuch a tenacious nature, that it reſiſted the drought, ſtill retaining moiſture ſufficient, with the dews that daily fell, to bring the crop to maturity. As the climate was very warm, and the grain, of

 conſequence,

conſequence, a very ſhort time in the ground, they had often two crops in one year. But as it is now more than 3300 years ſince the Nile overflowed its banks, we may reaſonably ſuppoſe, that all the large extent of country called Lower Egypt, is now partly filled up, by the ſediment or ſlime leaving a little every year; ſo that now the water will not have the ſame effect upon the ſame ground, that it had in thoſe early periods of time. But ſtill the ſoil will be very rich, and produce great crops, though not ſo great as at firſt.

Secondly, It is above twenty years ſince I adviſed the embankment of the river Tay, at the conflux of the Earn with it, upon the eſtate of Eaſter Rhind, and likewiſe propoſed, to join the iſland in the Tay with the mainland.

Although none of theſe were done at the time mentioned, the embankment has ſince been made in ſome parts, and the iſland alſo banked in; both of which have produced very great crops. Mr Somerville the tenant told me, he had above twenty bolls of oats upon each acre, the firſt crop upon the iſland.

Mr

Mr Hay of Leys has banked in Mugdrum inch in the ſame manner, where he has had extraordinary crops.

The advantage of theſe places is, that they can be enriched by overflowing with water, by means of fluices, which ought to be done every year.

Lord Weymſs is joining the iſland to the main land, by a ſtone bulwark acroſs; by which he will acquire a conſiderable quantity of very fine ſoil. And I am informed by Mr Somerville already mentioned, that it is filling up an inch every full tide, in twenty four hours, when the water is muddy.

Thirdly, General Graham has made ſome very great improvements upon the moſs grounds below his houſe at Gorthie, firſt, By cutting ditches acroſs to drain it, and dividing the ground into different incloſures; ſecondly, By banking out the river called the Powe.

By theſe embankments, he keeps off the water that comes either from the high grounds or the river. At the ſame time, he has wooden fluices, after the Dutch form, upon each of his incloſures, to let the water in and out at pleaſure; and thus he produces

very

very good crops both of corn and paſture. His factor, Mr M'Cale ſhewed me one incloſure in particular, where he ſet out with paring and burning. On this field he has had thirteen crops of oats running, and the laſt better than the firſt; the crop 1786 being ſold for L. 9 ſterling an acre as it ſtood.

The method taken here, is to give the ſeed furrow in the autumn; then the river Powe, being a ſlow running water, and very muddy in the winter time, is let in, and ſtands on the field four or five feet deep during that ſeaſon, by means of opening all the ſluices. A conſiderable ſediment is left from the waters of the Powe, and likewiſe thoſe coming from the higher grounds; which anſwers the ſame purpoſe as dunging every year.

The General has ſet ſome parts of the ſame moſs, ſo incloſed, at two pounds per acre each year, for plowing, and his tenants are very well pleaſed. I was much ſurpriſed to ſee ſo much good paſture upon it; and Mr M'Cale informs me, that the graſs is very nouriſhing and fattening, eſpecially for young ſtore.

This is the greateſt improvement upon a moſs I ever ſaw; and the expences of drain-

ing

ing and cutting the ditches at firſt were not ſo great as any one would imagine from ſeeing them. Being moſs, it was not difficult to cut; and by perſevering in the ſame plan, the ſoil will become richer every year; although I do not approve of taking ſo many crops of oats running. But this ſhews the fertilizing effects of the water.

The fourth inſtance I ſhall mention is, that a gentleman, whoſe veracity I can depend upon, told me, that the tenant of certain lands on a river-ſide in England, where ſeveral corn-mills had been erected, came to the proprietor, and told him, that if he would allow the mills to be deſtroyed, he would ſtill pay him the ſame rent he was wont to pay for both mills and farm. The proprietor at firſt refuſed his offer, alledging that he ſhould loſe the multure for his mills; but, after taking the matter into conſideration, he offered to agree to the terms propoſed, if the tenant would give him L. 100 yearly of advanced rent. This the tenant engaged to do, and then threw the whole of this low ground, which was of conſiderable extent, into graſs. Having the advantage of the falls for the mills, it was now in his power to overflow

the

the whole of it with water from the river; and this method he practiſed with ſuch ſucceſs, that he raiſed three crops of hay in one year. The gentleman from whom I had this account told me, that he ſaw ſome of theſe hay crops, and that they were the weightieſt he ever beheld.

The laſt inſtance which I ſhall mention of the great advantages of embanking, I received from John Erſkine, Eſq; of Mar. He informed me, that he has banked in about 45 or 50 acres all taken off the river upon the ſide of the Forth, below Alloa. The bank is about ten feet high, and very broad at the baſe, all raiſed from the mud and turf, without any ſtone. The ſlope of the bank is one foot in five. This he has covered over with green turf, taken from the inſide of the bank. It may appear ſurpriſing, that when they firſt began to raiſe the bank, there was nothing but mud in the inſide, and that very looſe and deep; yet, before the bank was finiſhed, they got as much green turf from the inſide, as to cover the whole of the ſloping bank, which ſtands very well, and reſiſts the force of both land-floods and tides.

The ground in the inſide is now turned-

ſolid

ſolid and firm, ſo as to allow the plows to go. The whole of this incloſure, taken off the river Forth, is now let for one guinea per acre. Mr Erſkine thinks that he is well paid for his trouble and expence; and that the ground will be ſtill increaſing in value, as he has the means of overflowing it whenever he pleaſes.

It is amazing to ſee the great encroachments which the river Forth has made, and is ſtill making, carrying away yearly very great quantities of rich ſoil.

However, the attention of the proprietors is now awakened. Mr Abercrombie of Tullibody, and ſeveral other gentlemen have been equally ſucceſsful with Mr Erſkine. And it may be expected, that their example will influence the landholders on the Forth, and in ſimilar ſituations, to attempt improvements, which are ſo intereſting to themſelves and beneficial to their country. For not only in this river, but in almoſt every river in Britain that communicates with the ſea, an immenſe quantity of ground might be recovered from the rivers and ſea; even at the mouth of many rivers. Vaſt tracts of land might be made good, that are at preſent ſand and gravel.

It

It is aſtoniſhing to think, how much good ſoil every year is carried away with the land floods into the ſea; a great part of which might be retained by contracting the rivers, particularly at the end where they run into the ſea.

If rivers great and ſmall, were ſtraightened, and more confined, with banks of a gentle ſlope, covered with a green ſwaird, the damage would not be ſo great at every land-flood as it now is.

If the mouth of every river was confined, and carried conſiderably farther out into the ſea, in a courſe of years, a great addition would be made to the coaſt. For the ſoil that comes down the river, would in part ſettle upon the ſhore, wherever there was an eddy, and, at the ſame time, the river would be deepened; and conſequently, the navigation rendered ſafer, as the tides would be higher when confined, than when allowed to ſpread over a great tract of ground.

This plan has been actually carried into effect at Aberdeen; and, by this means, a ſand-bank, which had nearly choaked up the mouth of the river, has been carried off.

There are many ſituations by the ſea-ſide, which

which are nothing but ſand and gravel, and thoſe of large extent, which might be much enriched, if a part of the rivers were turned off a little above, ſo as to run upon theſe ſands, every time there was a land flood, and made to ſtand dead; which might be done, by raiſing a ridge a little diſtant from the ſea, and covered with green ſwaird. By this means, the mud would ſettle upon the ſurface, and, in a courſe of years, make it a rich paſture; which ought never to be plowed, but to be kept conſtantly in graſs, and flooded every year in the winter time, and ſometimes in ſummer.

Wherever there is a city or town ſituated a little above a ſandy ſhore, the water from the ſtreets might all be made to run into theſe flat places, which ought to be levelled as much as poſſible, and the hollow parts filled up before the water was let on.

What is ſaid, might be applied with great ſucceſs upon every part of the ſea-ſhore where there is a large tract of ſands. The water coming from the city of Edinburgh might be conducted ſeveral miles along the ſands.

The ſands from the mouth of Tay to Ar-

" do mifchief to the land; or, at leaft, fhall
" never correct its ill qualities.

" At all times, when governments have
" taken thefe different objects into confider-
" ation, we have feen entire countries change
" their face. What have not the Dutch
" done, by damming out the fury of the fea,
" and fecuring themfelves from inundations,
" with which they are inceffantly threaten-
" ed? How many lakes and marfhes have
" been happily drained? In China, we fee
" two of their fineft provinces gained from
" the fea, by the induftry of the inhabitants.
" (Thefe two provinces are called Kiang-nan
" and Iche-kiang. Their fertility is extraor-
" dinary.)

" In Perfia, on the contrary, a dry coun-
" try, where the land requires being water-
" ed, what efforts are made, and with what
" fuccefs, for conducting ftreams of water?
" Among that nation, if any one has the art
" of conducting water, or fountains, in any
" place where it never was before, he has the
" enjoyment of the advantages of it for five
" generations. The charge of fuperintend-
" ing the water was, among the Perfians, the
" moft important in the ftate. All thefe ex-
" amples

" amples ſurely prove, that with the atten-
" tion of government, we may be able to re-
" preſs the impetuoſity of the waters, and
" direct them according to our will to the
" greateſt advantage of the country. If we
" abandon all to hazard, and the care of ſim-
" ple individuals, we ſhall never be long in
" ſeeing the moſt fatal effects. The evil, we
" know, increaſes every day, until it be-
" comes irreparable. The conduct of waters
" requires much underſtanding. It ſhould
" be under the view of enlightened eyes,
" who know well how to direct the neceſſary
" works; otherwiſe we riſque the ſeeing ve-
" ry different effects reſult from what we ex-
" pect.

" When we would wiſh to conduct a wa-
" ter over a dry ſoil, every one is not in a
" ſtate of pronouncing, if it will be proper
" to undertake it; becauſe all the world
" knows not how to calculate the advantages
" which may be procured by canals for wa-
" tering, or the expence of conſtructing and
" repairing them. We ought, therefore, in
" all ſtates truly political, to excite happy
" geniuſes to ſtudy the whole that belongs
" to the architecture of waters, and to turn
" their

" their views and ſerious reflections on that
" ſide.

" What ſervices might be rendered to the
" country by men paid by the government
" for making it their principal occupation,
" to know diſtinctly all that is practiſed by
" divers nations, and in particular the Dutch,
" for banking out rivers, for placing their
" works in a ſtate of reſiſting the action of
" the waves, ſlow, or violent; for draining
" marſhes; for directing the waters, and
" diſtributing them conformably to the
" views propoſed.

" A ſovereign ought never to be the ſubject
" of regret, for giving penſions to thoſe who
" having the neceſſary talents, conſecrate
" themſelves to a ſtudy ſo uſeful to their
" country."

There is a very conſiderable difference as to the quality of waters, ſome having a more fertilizing property than others.

As ſaid before, the muddier that the water is, the better; and the quality of it much depends on the richneſs of the ſoils that the river has to paſs through; part of the fine particles being carried down and depoſited on the low grounds.

Where

Where the water comes over a large body of limeſtone, it has a particular fertilizing quality.

All waters, eſpecially when muddy, fertilize the ſoil, provided they are made to ſtand dead; though every one not in an equal degree.

From theſe obſervations it is very clear and evident, that many ſoils, in the different ſituations deſcribed, may be ſo improved, by means of incloſing, draining, banking, and then watering, as to make the pooreſt of them at leaſt double, and ſome of them above ten times their preſent value. And that, perhaps, at not the twentieth or even the hundredth part of the advantages ariſing from purſuing the methods recommended. Therefore it ought to be the ſtudy of every gentleman proprietor, and tenant, to improve upon theſe hints, according to their different local ſituatious.

The very great profits that would ariſe from incloſing, draining, banking, and then watering of moſſes, moraſs, and meadow grounds, by the ſides of rivers, makes me often wonder how they came to be ſo univerſally neglected; when it is conſidered how

ſmall

ſmall the expence would be, and the advantages ſo great, when properly conducted, agreeable to this plan.

Theſe places would not only produce extraordinary crops in moſt ſeaſons; but they have this advantage over moſt of the other grounds in the country, that in a very great drought, when the crops fail in almoſt every other place, all theſe places that have been much overflowed in winter, would produce very weighty crops, both of hay, paſture and corns, more particularly, a great crop of lint, as they could be flooded when growing.

Theſe are the only places where a good and weighty crop of flax can be depended upon; and, at the ſame time, the flax would be much finer. Witneſs the flax crop in Holland and in Egypt. What is it that has made Egypt ſo much renowned in all ages for fine flax, but the overflowing of the river Nile?

Although it is not pretended that we could raiſe ſuch great crops, or ſo fine as in Egypt; yet theſe places that were water-fed for many years, would produce as much upon one acre, as the other grounds upon two or three acres, and the flax much finer. This of itſelf ought to induce the practice recommended, although

it

it had no other advantages; for a great crop of good fine flax is worth two or three of the beſt crops of corns.

It is not propoſed to plough the ground after one year's flooding; but the water ſhould be continued for five or ſix years, or more.

This is what has hurt the character of grounds being benefited by water running upon the lands in the winter time, viz. that a great many plough the land watered only one year, which often produces great crops; and, what is ſtill worſe, they continue cropping for two or three years more without any other manure. This impoveriſhes the ſoil very much; the ſame as lime and ſhell marl, when firſt laid on, which produce very great crops for a few years; but if continued to crop without dung, and being thrown into graſs, impoveriſhes the ſoil ſo much as to make it unfit to produce either corns or graſs.

Since writing the above, a gentleman told me, he knew a field by the ſide of the river Tweed, which was ſo poor, that the farmer deſpiſed it, not thinking it capable of any improvement for either corn or graſs, which procured but very little paſture. It com-

monly went under the name of the Windle-ſtraw field. It happened one year, that the river Tweed ſwelled by a land-flood to an uncommon height. This field was overflowed. The hedges, with the bank kept in the water, ſo that it ſtood dead upon it. The conſequence was, that the next year, to the farmer's great ſurpriſe, the whole field was wholly covered with white clover.

It is ſomewhat ſtrange to conſider, that the greateſt improvement in every art is often found out by accident. It is ſtill more ſtrange, when thus found out, theſe very great improvements, at ſo little expence, are not perſevered in. The field would be ſtill improving, if the water was laid on every year, and would alter the nature of the ſoil altogether.

The reaſon why theſe methods are not more adopted, may in part be owing to one of theſe things :-

Firſt, The want of attention to the nature and ſituation of the ſoil.

Every ſituation has its own advantages and diſadvantages, ſome more than others. The great matter is, to ſtudy what is the moſt ſuitable improvement that can be made upon-

on every ſituation at the leaſt expence. Wherever you have moſs to lay on, it alone will improve the paſture, and arable land: And if you have lime to lay above it, will produce great crops, both hay, paſture, and corns.

Moſs and hot lime, laid on carſe clay, will produce great crops of wheat. This laſt is practiſed in the carſe of Stirling with very great ſucceſs.

Laying moſs and lime upon the pooreſt ground when dry, even the bare rocks, will make good paſture, where neither of them is to be found. Draining and watering will alter the nature of the ſoil very much.

The ſecond reaſon may be, ſome perſons are afraid of the expence. This proceeds from want of experience. It would aſtoniſh one who was unacquainted with theſe things, to find how ſmall the expence for draining, banking, and watering is, comparatively to the crops ariſing therefrom.

Suppoſe one had occaſion to lead the water along the ſide of a hill or bank, in order to water the plains below a mile long, the cut twelve inches wide and deep. This can be done for a penny at moſt each rood, being ſix yards in length; three hundred of which make

make a little more than a mile; this is only one pound five ſhillings. If eighteen inches broad and deep, at twopence per rood, would be two pounds ten ſhillings for one mile. If ſixpence per rood, ſeven pounds ten ſhillings. If five foot wide and three deep, at one ſhilling, fifteen pounds per mile; and ſo on in proportion.

Now, let any perſon conſider the expence, and advantages ariſing from watering, perhaps ſome hundreds, or a thouſand acres by this cut. The longer the water has to run, the cut would need to be wider and deeper.

This cut might anſwer in part for a drain to the grounds above, if thoſe below were a dry ſoil, and moſs above the cut. The ſmall moſs might be turned into the water, which would enrich the fields below. Even a rich clay, rock, or ſhell marl, might be mixed with the water, and by theſe means enrich the plains below.

One perſon could manure many hundred acres in one year, by mixing whatever ſoil was above with the water. This would ſave the trouble of carting it down the hill.

In place of a ſluice upon the banks by river ſides, in ſome places, a large fir tree, with a bore

fourteen

fourteen or ſixteen inches diameter, or a ſquare box, might anſwer the ſame purpoſe, by having a piece of bend leather nailed upon the end of the tree, upon the upper ſide, which would open and ſhut the ſame as the valve of a pump; having a ſmall piece of wood nailed to the outſide of the leather: If thought proper, to place one at each end, to let water in and out at pleaſure. The tree need not be longer than the bank is broad.

The expence of draining may be calculated in the ſame way.

If at a penny per rood, the expence for a mile would be	L. 1	5	0
If at two pence, each mile,	2	10	0
If at ſixpence, do.	7	10	0
If at one ſhilling, do.	15	0	0

The embankment and ſloping may be calculated in the ſame proportion.

Water in this way may be led along the ſide of a hill for many miles.

In ſome ſituations, a narrow level canal could be made to tranſport goods from one place to another; which might be got done at two ſhillings or half a crown each rood.

The third reaſon is, That perſons may be doubtful of its anſwering the end propoſed.

What

What is formerly ſaid, it is hoped, may be ſufficient to convince every farmer of the utility and advantages ariſing from enriching the grounds wherever ſituated, by water-feeding.

The great crops produced by the overflowing of the Nile, and the great expences laid out by the Egyptians for the proper conducting of the water, is a convincing proof of what is ſaid before, as appears from the following extract from Mr Savary's letters on Egypt, vol. ii. p. 227.

" Agriculture was in great eſteem amongſt " the antient Egyptians. They had render- " ed it very flouriſhing in the whole extent " of their empire. Witneſs the immenſe " works they have made in the diſtribution " of the canals, and for watering the lands. " At preſent we reckon eighty canals like ri- " vers, all dug by the hand of men, ſeveral " of which are twenty, thirty, and forty " leagues in length. They receive the inun- " dation, and circulate the waters through " the country. Six only have water in them " the whole year. The others, nearly choak- " ed up, are dry upon the fall of the Nile. " The great lakes of Moeris, of Behire, and

" Mareotis

" Mareotis form vaſt reſervoirs calculated to
" contain the ſuperfluous waters, and at
" length to ſpread them over the adjacent
" plains. They raiſed them upon the elevat-
" ed grounds, by means of vertical wheels,
" the invention of which is due to the E-
" gyptians. One ox was ſufficient to turn
" them, and to water a vaſt field. Theſe
" wheels gave to Archimedes, in his journey
" into Egypt, the idea of the ingenious chain
" or chaplet, ſtill made uſe of in our days."

Page 229. " The waters are conveyed by
" aqueducts to the very ſummit of the hills.
" They were received there in immenſe ba-
" ſons hewn out of the rock; from whence
" flowing into the midſt of deſarts, they con-
" verted them into fruitful fields."

Page 232. " We may confidently aſſert,
" that upwards of one third of the lands for-
" merly in cultivation are metamorphoſed in-
" to deſarts."

Page 235. " This negligence gives a mor-
" tal ſtab to agriculture. A whole diſtrict,
" which owed its fertility and its riches to
" the waters of a canal, no longer receiving
" a ſufficient quantity, become uncultivated,
" and abandoned. The Nile, in the courſe

" of

" of 900 leagues traverſing deſarts and bar-
" ren mountains, brings with it a prodigi-
" ous quantity of ſand and mud. How cul-
" pable are they who thus ſuffer the ſprings
" of plenty to dry up? For wherever the wa-
" ters of the Nile are conveyed, there is the
" earth covered with treaſures. It only ſeeks
" to be productive."

The Egyptians in antient ages were eſteemed the moſt learned people in the world. There never was a nation who made ſuch ſolid and permanent improvements in agriculture, only by means of water.

Although they were at an immenſe expence in making canals and reſervoirs, and keeping them in good order; yet they were amply paid for all their trouble and expence, by the wonderful crops of all kinds that were produced. This improvement was not for one age, but has continued for ages, as far back as hiſtory gives us any account. Egypt was often the granary of the world. When famine was in moſt places, they enjoyed plenty; having ſo much grain annually to export, their trade was increaſed to a very great height. This was, in reality making agriculture the foundation of trade. This

great-

great and permanent improvement was derived from ſtudying their natural ſituation, and uſing the proper means to take the benefit thereof.

Ought not Britain, then, to follow their example, and ſtudy the natural ſituation of every place: And, wherever water can be introduced, to uſe the proper means for ſo doing; even although at a great expence, in many canals for many miles.

In making canals, they might, in ſome ſituations, attend to two particulars: Firſt, That of water-feeding: Secondly, The tranſporting of goods from one place to another. The water-feeding would not hurt the canal, as the water could be let on in the winter time, when the water was both plenty and muddy.

It is wonderful to think, what very great improvements could be made every where by means of water, both in hills and low country.

The vaſt number of great lochs in the hills could be made uſe of as ſo many reſervoirs to open with ſluices in time of drought, to water the plains; or might be led into a dif-

 ferent

ferent tract to water barren grounds, either in plains, or by the ſea-ſide.

In many of theſe lochs, when drained, vaſt quantities of ſhell marl might be found.

There might be a ſmall cut made far up upon river-ſides, to lead the water a conſiderable way to water plains.

The very great number of places called links and ſands, by the ſea-ſide, would be greatly improved by means of freſh water running and ſtanding dead upon theſe, and many other places. This watering to be continued every year.

This improvement would laſt for ages, and the ground would ſtill be increaſing in richneſs, as long as the water was uſed; which ought never to be given over, but the water to be led on to one field or other, which would greatly increaſe both paſture, hay, and corns.

Take the moſt barren ſands, or gravel, when level and dry, and make the water ſtand dead upon it, it will enrich the land to a very high degree, both for paſture and corns.

That we may have ſome idea what very great crops may be produced from water-

flooding,

flooding, and to what an extraordinary length this method of improvement may be carried, let us again take a view of the Egyptians' improvements, by means of water, and the wonderful effects of their national induſtry.—— What a nation can do, when united in one object! It almoſt exceeds our belief.

Although the waters of the river Nile had an uncommon fertilizing quality; yet the advantages ariſing therefrom would have been very ſmall, if the Egyptians had not adopted ſchemes for diſtributing the water over a very large tract of country of 200 leagues, never paralelled by any nation in the world. Their ſchemes were admirably well calculated for anſwering the ends propoſed.

We are informed by Savary, that they firſt altered the courſe of the river Nile altogether, which formerly run by the ſide of lower Egypt; but now, ſince altered, they have made the Nile run almoſt through the center of lower Egypt, and branched it off, as he ſays, " in eighty canals, like rivers, all dug by the " hand of man, ſeveral of which are twenty, " thirty, and forty leagues in length. The " great lakes of Moeris, Behire, and Marco-

" tis,

" tis, form vaſt reſervoirs calculated to con-
" tain the ſuperfluous waters, and at length
" to ſpread them over the adjacent plains."

He likewiſe ſays, " Some great dykes, the
" ruins of which are to be ſeen, ſerved to
" keep in the river; others were oppoſed to
" the torrents of ſand, which have a conti-
" nual tendency to cover the face of Egypt."

Theſe canals were ſpread over the whole country, like the branches of a large tree.

The immenſe ſum theſe grand works would coſt is almoſt beyond our conception. Indeed, at this diſtance of time, it is impoſſible to calculate the expence. Yet we are ſure, whatever the ſums were, although many millions ſterling, they were amply paid for their trouble and expence, when theſe canals were kept in repair. But now, we are informed, that a great number of them are choaked up; and, of courſe, the produce is not one hundredth part of what it was in antient times.

This ſhews us, that the beſt calculated ſchemes that ever were invented for any kind of improvement, if not perſevered in, will ſoon go to ruin.

The dimenſions of lake Moeris were aſto-

niſhing,

niſhing, which Savary ſays, is reported by Herodotus and Strabo, to be 75 leagues in circumference, and 300 feet deep. This almoſt incredible lake, ſaid to be dug by the hand of man, ſhows what mighty works can be done by a great army of men.

However ſtrange this may appear upon the firſt view, yet if we only conſider the ſituation of the ground where this lake was, in a deſart of ſand, the attempt will not ſeem difficult; for the run of the river Nile was conſiderably above it, which, we are informed was brought by a canal, named Joſeph's, forty leagues in length, to lake Moeris.

And thus, having the command of the river Nile by this canal, we may ſuppoſe that the moſt probable means of effecting the work was, to dig ſeveral deep canals the whole length of the lake, and to let in the water into one at a time, which would both deepen, and carry off a conſiderable quantity of the ſand, and then by ſhifting the water to another canal. Some thouſands of men that were employed, would be always deepening one of theſe canals. Thus, by this means, letting the water only run in one canal at a time, and ſhifting it to another, would

would carry off a vaſt quantity of ſand, when the canals were ſtraight, and had no interruption. And we are to ſuppoſe that the fall of the water was very conſiderable.

The following extracts ſhew the extent of this lake.

"The labyrinth, ſays Herodotus, ſuch as "I have been deſcribing it, is ſtill leſs ſur-"priſing than the Moeris. This lake is in "circumference 3600 ſtadia, or 60 ſchenes, "which form the dimenſions of the mari-"time baſe of Egypt, (75 leagues), it ſtretches "from north to ſouth, and its greateſt depth "is three hundred feet. Two pyramids con-"ſtructed in an iſland towards the middle, "riſe from three hundred feet below water, "and are as high out of it; which proves "that it has been dug by the hand of man. "Each of them has on its ſummit a coloſſal "ſtatue ſeated on a throne. Their total ele-"vation, taken from the baſe, is a ſtadium "of ſix hundred feet. Lake Moeris occupies "a ſoil very dry, and deſtitute of ſprings. "It derives its waters from the Nile, which "runs there during ſix months. The reſt of "the year it reſtores them to the river. Dur-"ing the former period, the fiſhing produces

"a

" a talent of ſilver daily to the royal treaſury,
" and twenty minas only during the latter.
" According to the natives of the country, a
" canal is pierced acroſs the mountain, the
" extended chain of which commands Mem-
" phis. This is an outlet, by which the ſu-
" perfluous waters are poured into the ſands
" of Lybia, on the weſtern ſide. I enquired
" what had become of the earth taken from
" the lake; they aſſured me that it had been
" conveyed to the river, and carried by the
" current to the ſea."

And then Mr Savary joins the report of Strabo to that of Herodotus, as they throw mutual light upon each other.

" The province of Arſinoe contains the
" wonderful lake of Moeris. It reſembles the
" ſea in its extent, its colour, and its ſhores.
" As deep as it is vaſt, it receives at the be-
" ginning of the inundation the waters
" which would otherwiſe cover the harveſts,
" and the habitations of men. They are con-
" ducted thither by a great canal. When the
" Nile ſubſides, they return by two other
" canals, (thoſe of Tamieh and of Bouch,)
" which, as well as the former, ſerve for
" watering the fields. All this is naturally
" performed.

" performed. At the head of the canals, " ſluices are formed, which are opened at " pleaſure, whether to introduce, or let off " the waters."

Theſe canals and reſervoirs are ſaid to have been executed by King Moeris five hundred years before the Trojan war; and they were kept in good order for many centuries after. During which periods Egypt produced ſuch wonderful crops of all kinds, as ſurpriſed the whole world; and would have ſtill continued to do ſo to this day, if the ſame care had been taken of the canals for diſtributing the water.

Although Egypt in theſe antient ages was extraordinarily populous, more ſo than any nation in the world at that time; yet they had not only great plenty to ſupply themſelves, but amazing quantities of corns to export for the ſupply of many other nations. We know that they frequently afforded aſſiſtance even to the plentiful land of Canaan; for we read of three famines at different periods, when they were ſupplied with corn from Egypt, and could not be ſerved any where elſe.

But, if I may be allowed to hazard a conjecture,

jecture, I ſhould be inclined to attribute to Joſeph the canal which is called by his name, and which ſerved to conduct the water into lake Moeris. Likewiſe lake Moeris itſelf, and the other different canals for diſtributing the water over the whole land of lower Egypt.

The whole of this work appears to be ſo admirably contrived to anſwer the end propoſed, for enriching every part of the country, and to prevent the river Nile from overflowing its banks, when at its greateſt height, by means of theſe incredibly large lakes, that it ſeems to have been deviſed by a very uncommon and extraordinary genius, not to be paralelled in hiſtory.

The enormous expence it would take to dig theſe canals and lakes, to ſerve as reſervoirs, is another reaſon why we may ſuppoſe that none but Joſeph could attempt ſuch an undertaking. For what kingdom could defray the expence, or would, although they had been able, being uncertain of the ſucceſs.

The altering the courſe of ſuch a large and rapid river as the Nile, is liable to ſo many unforeſeen accidents, that one would imagine it might have deterred any kingdom from ſuch an arduous undertaking. But Jo-

ſeph had a command of money equal to the magnitude of the work. For the great treaſures he received during the ſeven years of plenty, were ſufficient to enable him to effect this undertaking.

It is probable, that a part of it might be done before or during the ſeven years of plenty. The good effects ſhown by the extraordinary crops that were produced, would encourage him and the whole nation to go on with alacrity with what remained. The whole kingdom of Egypt was under his government. And it is probable he enjoyed his office for eighty years, and, conſequently, would acquire great experience.

It is alſo well known, that popular tradition in Egypt attributes all their greateſt works to him. An opinion, which however falſe in many inſtances, is probably in ſome caſes well-founded.

I ſhall now proceed to make ſome general obſervations that may be uſeful for many ſituations.

Although it cannot be expected that ſuch great crops as were produced in Egypt can be raiſed in Britain, as we have not the ſoil, water of the ſame fertilizing quality or climate;

yet,

yet, by following the ſame plans in miniature, very extraordinary crops could be produced, both in Scotland and in England, double of lands not water-fed.

How many ſmall canals could be made in almoſt every part of Scotland, and many in England, by the ſide of moſt rivers, and along the ſide of hills, for conducting the water many miles, which might anſwer many good purpoſes.

That this is capable of being reduced to practice, we are informed by Volney, in page 300 of the firſt volume of his travels through Egypt and Syria, " That the inha-
" bitants of Syria, notwithſtanding the
" mountaneous ſituation of the country, pro-
" fited by the water. They conducted it by
" a thouſand windings along the declivities,
" and ſtopt it by forming drains in the val-
" lies; while in other places they prop up
" ground ready to crumble away, by walls
" and terraſſes. Almoſt all theſe mountains
" thus laboured, preſent the appearance of a
" flight of ſtairs, or an amphitheatre, each
" ſtep of which is a row of vines or mulberry
" trees. I have reckoned from an hundred to
" an hundred and twenty of theſe gradations
" on

" on the ſame declivity, from the bottom of
" the valley to the top of the eminence."

The canals need not be large, but rather more numerous, having them twiſting along the banks, or a dead level; and large quantities of goods, might be tranſported by them, in long, narrow flat-bottomed boats, drawn with a horſe, or puſhed along by men with long polls.

The canals would, when properly made, help to drain the grounds both above and below.

By theſe means water could be conducted to many barren ſpots, both upon the ſide of hills, and in many plains; in ſome places by the ſea-ſide, where there is nothing but ſand or gravel. Letting the water ſtand dead, would in time produce a new ſoil.

In ſome ſituations, theſe canals might ſerve corn and other mills with water-falls.

Indeed, every farmer who has the command of watering ought to make this his ſtudy.

How many lochs great and ſmall could be drained, at leaſt in part, to ſupply theſe canals in ſummer, although in winter leſs needed.

How

How many of theſe lochs, when drained, have great treaſures of ſhell marl in the bottom, which is an excellent manure, either for corns or graſs.

The water that is impregnated with ſhell marl, or lime-ſtone, is very rich. Rock marl, or fullers earth, is good alſo, and clay for light ſoils.

How many very extenſive moſſes, moraſs, and meadows could be thus drained, ſo as to produce great crops of graſs and corn; and after being drained, much enriched by being flooded yearly? Theſe, in many places extend very far. I am informed, that the moſs to the eaſtward of Glencoe, ſtretches out as far as the brae of Marr, fifty or ſixty miles; all of which could be drained, and then flooded.

Mr John Knox, in his Tour through the Highlands of Scotland, and the Hebride iſles, in 1786, ſays in page 272. "Between Durneſs and Caithneſs there is a tract called the "Maon, which ſignifies, the great moraſs, "about twenty or twenty-four miles in "length, by eight in breadth, which muſt "be paſſed by all travellers on that coaſt.

"This

" This tract ſeems to be partly a deep mo-
" raſs floating upon water.

There are a great number of moſſes and moraſſes, ſome of which are of conſiderable extent, both in the highlands and low country. Moſt of them could be drained at a very ſmall expence; and the water might be conducted to other barren ſpots not far diſtant, and would greatly improve the paſture.

The want of a ſufficient declivity to carry off the water, renders it difficult to drain ſome moſſes. But wherever we can find out the feeder or ſpring, which ſupplies the moſs with water, and which in ſome places might be done, the draining could be eaſily effected, by giving the water a different turn, a conſiderable way before it enters the moſs.

In ſome moſſes, to render the draining compleat, it may be neceſſary to cut a drain a conſiderable diſtance below the moſs.

Many landholders are, perhaps, deterred from attempting to improve moſſes and moraſſes, through an idea that the expence will be immenſe. I am, however, convinced, and ſhall preſently almoſt demonſtrate, that, in many ſituations, if the work is properly executed,

ecuted, the expence, however great, would be more than reimburſed by the product of the firſt year. There is, indeed, no other ſpecies of improvement, that can be made upon land, which will ſo amply, or ſo rapidly repay the expence.

It is not here ſuppoſed, that all moſſes will afford an equal profit to the improver. The difference in their quality is great. But the pooreſt, if compleatly drained, pared, and burnt, will make good paſture. Many would be worth twenty ſhillings an acre for paſture only. And if the ſituation were ſuch, that it could be flooded with water, in autumn, winter, and ſpring, great crops of hay might be raiſed. Nay, in ſome places where the water could be made to ſtand dead, a crop of hay might be obtained every year. In this caſe, however, no cattle ſhould paſture upon it, either in winter or ſpring; as paſturing would greatly decreaſe the weight of the crop.

The moraſs deſcribed by Mr Knox, contains above one hundred thouſand acres; which, if the moſs is good, would produce amazing crops of corn and graſs; and the expence, though conſiderable, would probably

bly be defrayed by the produce of the firſt year.

To reſcue ſuch an extent of land from its preſent wretched ſtate, would be an act of real patriotiſm. Self-intereſt, humanity, and fame, call upon the gentlemen of Caithneſs to make the attempt. They may enrich themſelves, give bread to thouſands, and acquire a glory, which, to common ſenſe, will appear more brilliant than that of the hero, whoſe celebrity is obtained by ſhedding the blood of his fellow-creatures, and whoſe triumphs are marked by the deſolation of provinces.

And to give at once a deciſive anſwer to every objection which can be raiſed from the ſuppoſed difficulty of the taſk, the greatneſs of expence, or uncertainty of profit, we ſhall here point out the proper method to be purſued; and give an eſtimate of the expence for draining a moſs or moraſs of a mile, or 1800 yards ſquare; and ſhall add a calculation of the profit which may be reaſonably expected.

With reſpect to the method, I would propoſe, that a drain ſhould firſt be caſt all round upon the outſide; and then, that it ſhould be divided

divided at right angles, into a number of inclosures equal in size. The number must be determined by the state of the moss. Supposing sixteen divisions are sufficient, they will be about 40 acres each. If 32, 20 acres, or if 64, 10 acres.

The drains should all be equal in size, ten feet wide at the top, four feet deep, and two feet wide at bottom. From these proportions they would have a considerable slope, which would prevent the earth from falling in. The slopes should be sowed with grass seeds as soon as cast; and in a few weeks, in summer, a swaird would be formed upon it.

The earth taken out of the ditches should be thrown to as great a distance on each side, as the workmen can throw it off the spade. But if the moss is very loose, a man should be employed on each side, to throw it farther back, that the weight may not press in the moss.

The plan of villages affords an exact representation of the drains here proposed; if we consider the streets in the plan as representing ditches.

If there is any difficulty in keeping the drains open, another method may be used,

 at

at leaſt in a country abounding with long heather. A ſmall quantity of the heath may be put in the bottom of the drain, and covered over. The water would paſs freely under the heather; and perhaps, when thus covered from the air, the heath would not be conſumed in leſs than forty or fifty years. If this method is uſed, the drains need not be ſo large as the open ones above deſcribed. But the number muſt be greater; perhaps two for one, or more.

Eſtimate of expence for draining a moſs one mile ſquare, with open drains, and divided into ſixteen incloſures.

Three thouſand rood of ditching, at 1s. per rood - -	L. 150	0	0
Paring and burning 540 acres, at 20s. per acre	540	0	0
For ſeed, (either oats or barley) at half a boll per acre, 270 bolls, at 15s. per boll.	202	10	0
Levelling, graſs-ſeed, and unforeſeen incidents -	100	0	0
	L. 992	10	0

This ground requires no plowing, but only harrowing.

Now ſuppoſing the produce to be only ſix bolls per acre, either of oats or barley, and valued at only 10s. per boll, that is L. 3 per acre

	L. 1620	0	0
From this deduct	992	10	0
Profit	L. 627	10	0

If the ground is dry, and the ſeaſon favourable, the produce of the firſt year may perhaps amount to a third more, or even double the above calculation.

But although the firſt year's produce ſhould barely defray the expence of draining, the advantages gained are ſurely very conſiderable. There is, however, the greateſt probability, that a profit of above L. 600, would be obtained from the firſt crop.

It is not propoſed to ſow the ground the ſame year that it is drained. The draining, however, ſhould be performed in one ſeaſon, if poſſible; and ſhould be twelve months in that ſituation to drain, before attempting to pare and burn.

The paring and burning may be executed

for

for 15s. per acre, although above ſtated at 20s.

It would be advantageous to drain a moſs, and flood it every winter, even although it were not ſown with corn; as it would not hurt the peat for firing. Indeed, it would make the ſame moſs laſt much longer, as it could be digged for leſs expence when dry. At the ſame time, it would have double the quantity of peat in ſome parts, more upon the ſame ſurface of ground by going deeper.

By going deep, when drained, very great quantities of excellent ſhell-marl are often found in the bottom of moſſes.

The ſmall moſs mixed with water in the drain, and conducted to graſs or corn fields, is of ſervice to enrich both.

The following calculation of the expence of preparing, and profit ariſing from peats, will ſhew how advantageous a moſs may be made to the proprietors by proper management.

Marſhall's Rural Economy, page 98. "Minute 54. January 24. The following "is an accurate account of the peat grounds "of the fens.

"The

" The turf-man pays for rent	L. 0	4	0
" For cutting, from 1s. 6d. to 2s	0	1	9
" For chimneying, (that is, piling them lattice-wife to dry)	0	0	6
For boating to the ftaith, 6d. to 1 s.	0	0	9
	L. 0	7	0
" Profit and hazard, (great quantities are fometimes fwept away by the floods)	0	1	6
" The felling price per thoufand	L. 0	8	6

" The peats, when cut, are about four " inches fquare, but dry to about three inches " and a quarter; and from two to three feet " long, or of a length equal to the depth of " the moor; every foot of which, therefore, " affords nine peats; each yard 81; each " rod, 2,450¼; and each acre, 392,040; " which, at 4s. per thoufand, amounts to " the fum of L. 78 : 8 : 2 an acre: Befides the " additional advantage of having uncovered " a ftratum of earth, which, in many parts, " produces reed fpontaneoufly; and on " which, it is highly probable, that valu-

" able

" able aquatic might on every part be pro-
" pagated."

How many meadows in ſeveral places, if drained, and then overflowed, would raiſe good graſs and corns. The muddy water coming from theſe meadows, would help to improve other places at ſome diſtance.

In carrying an open cut many miles along any part of the country, it would meet with a great number of different ſoils; one part would help to improve the other.

Even where there is no run of water in ſummer, making ſmall cuts in almoſt every farm, and conducting the rain-water in winter to ſtand upon a barren ſpot, would enrich it much; more ſo, if the lands above were rich, and much improved.

In ſhort, there are very few ſituations, either in the highlands or low country, but might reap ſome benefit more or leſs, after being thoroughly drained, to make the water either run, or ſtand dead for a ſhort time when in graſs.

Even where the farm is wholly in tillage, when rich with lime, marl, or dung, if there is no dry graſs ground below to receive the water, having either a deep ditch the whole length

length of each field, upon a dead level to receive the water, where the mud and ſand would ſubſide. This carted off, to be mixt with dung, or laid on by itſelf. Perhaps this ditch would not need to be cleaned out but once in three years. Or having a large ditch, or pond, in the lower part of every farm, to receive the water in time of rain, with a ſluice to let off the water, after the ſediment ſettled to the bottom. This ditch or pond to be emptied when over full.

All theſe are only intended as hints, which farmers may improve upon, according to their different ſituations. But it is certain, that very many and great improvements can be made by theſe means of draining and then flooding.

Every farmer ought to ſtudy his own particular ſituation, and lay down his plans agreeable thereto. After trying ſome experiments, if they anſwer, (which without doubt they will, if properly conducted upon theſe plans propoſed) then to perſevere in them every year, doing but little properly at the firſt, and increaſing as they found the advantages ariſing therefrom.

If once this plan of banking, draining, and

flooding,

flooding, came to be univerſally adopted, the great profits would be better felt than can be expreſſed.

There are many ponds made below Edinburgh for damming the water that comes from the city, where the ſediment ſubſides, which collects great quantities of rich dung, ſome of which is uſed by farmers in the neighbourhood, and ſold by others. I have heard of one perſon ſelling dung collected this way for L. 70 a year.

Others flooding the ſmall meadows in graſs, with the water from the city, which raiſes both weighty and early crops, which admit of being cut three or four times each year. This is a very certain and profitable way for theſe perſons, when ſituations will admit of it in the neighbourhood of any town; or when they have water coming from lime or ſhell marl.

The water that comes from the city, if properly conducted, would enrich more than ten times the quantity of ſoil it does at preſent.

It is hard to ſay how much might be done this way, both here, and in many other places, having the ſame declivity.

Improvements

Improvements by embanking and overflowing with water, according to the plans here ſuggeſted, will, perhaps, apply, with ſome expence, to every ſpot in Great Britain, and every country in the world. As, even in thoſe places where they do not poſſeſs a running water, the rain water, during winter might be collected, either upon the farm, or at a diſtance from it, and conducted wherever it might be required; and the rain water coming off plowed lands is, at leaſt, as rich as that derived from rivers or ſprings.

To conclude, I ſhall add, as an additional encouragement to the practice of this mode of improvement, that corn, and other vegetables raiſed by flooding, muſt be more wholeſome than thoſe which are produced by any other ſpecies of manure. And many farmers that have practiſed it, have found it more beneficial than any other mode.

OBSERVATIONS

ON

VILLAGES, &c.

I HAVE read moſt of Mr John Knox's publications concerning the Britiſh empire and fiſheries, with his tours and obſervations. The public in general, and the inhabitants of the North of Scotland in particular, are under ſingular obligations to Mr Knox, for the great trouble and expence he has been at, in order to inform the nation how great advantages would accrue to the whole nation, and the navy in particular, if proper encouragement was given to the herring and cod-fiſhing.

It is very illiberal in the Reviewers, or others, to take notice of any little inaccuracies in Mr Knox's works, when his intentions are good. And, if the directions were followed, they

they would be productive of great advantage to the whole country.

If any perſon chooſes to improve upon Mr Knox's hints, I dare ſay he will think himſelf much obliged to them; but it is mean and wicked to overlook the ſpirit and end of any performance, and to carp at trifles not worth the mentioning.

I think the general principles Mr Knox inſiſts upon are good, and might be reduced to practice; although in ſome particulars I perhaps might differ a little as to his plan of villages, &c.

With all due ſubmiſſion to the honourable members of the Britiſh Society for extending the fiſheries, &c. I have preſumed to make a few obſervations, or throw in my mite towards the improvement of the fiſheries.

The inſtitution of this ſociety is highly laudable, and merits the encouragement of every one who has a love and regard to his country.

Obſervation firſt. Although the inſtitution is good, yet the future ſucceſs much depends upon the ſociety laying down ſimple and proper plans at firſt, and executing them with vigour.

Mr

Mr Knox, in his obſervations on the Northern fiſheries, printed in 1786, mentions many companies being formed at different periods, but from ſome unforeſeen accident they always failed. What has happened in former ages may happen in this.

One great cauſe why many of theſe companies failed, was fitting out veſſels with the proper apparatus, fiſhing tackle, &c. at a great expence, employing ſailors and fiſhers, at ſo much per month, who had no intereſt whether the fiſhing ſucceeded or not. I was informed, by a very intelligent perſon who was employed in the fiſhing within theſe fifteen years, that the ſhipmaſters went into one anothers veſſels and carouſed; which not only made the expences very high, but likewiſe neglected the buſineſs for which they were ſent.

Another great cauſe of their failure was the ſhips being at a great diſtance from any proper harbour; and when their nets gave way, they had not others to ſupply their place. Sometimes in want of ſalt, and a ſufficient quantity of barrels to hold their herrings. Or, if any misfortune happened to the ſhip, they often, from one or other of

theſe

theſe cauſes, returned home with a very ſmall cargo, that did not defray the expence. Whereas, if they had had proper harbours to go into upon the fiſhing coaſt, with great ſtore of ſalt, caſks, and ſpare nets, they might, inſtead of one cargo, have had three, four, or half a dozen, if allowed to purchaſe herrings from the natives.

Obſervation ſecond. The moſt ſimple, and the moſt effectual way of making the fiſhing trade profitable, is by following the Dutch method; among whom ſmall companies join together, ſuch as ſhip carpenters, coopers, net, or twine, and ſail duck makers, black-ſmiths, ſeamen, and fiſhers; every one to be paid in proportion to the quantity of fiſh taken. This would connect their intereſt, and the ſucceſs of the fiſhing together. There is no ſcheme that ever yet was deviſed will encourage labouring ſo much as piece-work. This is proved by the great height that manufactures of all kinds have arrived at in England, ſince this practice was followed.

It is very obſervable, that although you were to give a man a guinea per day, he is not able to work ſo hard as when employed in piece-work. When he knows his certain

wages

wages each day, by hard labour flattens his ſpirits; whereas, employed in piece-work, the thought of a little more gain, or hope of reward, keeps up his ſpirits, and he does not weary ſo ſoon as in the former way.

Wherever the company's ſhips are near a harbour upon the fiſhing coaſt, with proper warehouſes, wherein is plenty of ſtore, of ſalt, barrels, and nets, they can load ſix cargoes of fiſh, for one they do any other way; and veſſels of larger burdens might come to the ſtore-houſes, where their cargoes would be waiting for them. This leads us to the

Third obſervation. In order to accommodate the ſhips employed in the fiſhing ſtation, it would require a number of harbours and villages along the fiſhing coaſt, ſufficiently ſupplied with the above-mentioned ſtores. They ought to have all the ſalt duty-free, which might be made at each of theſe villages, as I am informed there is a great appearance of coals in that country.

The beſt method for making ſalt, would be, to have a large reſervoir for holding a large quantity of ſea-water, which might be pumped up, and there to ſtand for a conſiderable time, before let in to the ſalt pans for

making

making ſalt. The ſun would exhale a conſiderable quantity of the freſh water, which would make the ſea-water much ſtronger, and take leſs fire.

Poſſibly, the chryſtalliſation of ſalt might be effected conſiderably cheaper than it uſually is, if the ſea-water was conveyed into large reſervoirs in autumn; and, when frozen during the winter, the ice broken and taken out. As it is only pure water which congeals, the remainder would be much more ſtrongly impregnated with ſalt. And, perhaps, in a hot ſummer, the heat of the ſun would chryſtallize it; at leaſt, it would require leſs fire than the common method.

The fourth obſervation is, the proper plan for conſtructing theſe villages. In a great meaſure, the future ſucceſs of the fiſheries depends upon the villages being properly planned out at firſt. Every village ought to be as near the ſhore as the ſituation will admit.

In ſome places where there is a good harbour, which will only admit of building a few warehouſes, it would not be very inconvenient, although the villages were placed a ſhort diſtance from the ſhore.

There

There are ſeveral things to be conſidered in fixing upon the beſt ſituations for villages.

Firſt, The nearer the ſhore, the leſs expence for all carriages.

Secondly, Some regard ought to be paid, to prevent the place from being expoſed to privateers in the event of a war. There are many places upon the fiſhing-coaſts, by going a little up into a bay, river, or loch, the village would not only be warmer, being leſs expoſed to the winds and ſtorms from ſea; but the entrance could be eaſily defended by placing a few cannon upon a rock commanding a bay, without being at the expence of building a regular fort; although the village was up the bay, river, or loch, two or three hours ſailing.

Thirdly, Some regard ought to be paid to the moſt eaſy acceſs for feuel, as peats, &c.

Fourthly, Although the village may at firſt be but ſmall; yet, it ought to be kept in view, that perhaps the increaſe may be very conſiderable afterwards; therefore a large portion of ground ought to be purchaſed at firſt.

Fifthly, As proviſions in that country are

 often

often very dear, and ſcarce, every houſe would require a large garden from two to five acres, that would not only maintain a family in greens and roots, but alſo maintain a cow, to be wholly laboured with the ſpade. Vide National Improvements, page 270. Having the one half or two thirds of the garden in graſs, to be broke up by rotation. The remainder could very eaſily be laboured with the ſpade, at thoſe ſeaſons they cannot go to ſea; as the quantity of ground to be manured every year would be but ſmall, it could be done extraordinarily well; having the refuſe of the fiſh and ſalt, ſea ſhells, and weeds, or ware, with other dung made about the houſe or byre. Each houſe having a large garden annexed to it, would encourage ſtrangers to come and ſettle there.

Laſtly, The form of the village ought to be as near a ſquare as the ſituation of the ground will admit, and ſo planned out, if any additions are wanted, in order to enlarge it; ſtill the form, when finiſhed to be a ſquare. This can be very eaſily done, by making whatever additions are wanted of an equal breadth in each ſide of the ſquare.

After the moſt deliberate conſideration, I am

am clearly of opinion, that it is the intereſt of every proprietor in Britain, in whatever ſituation, whether upon the ſea-coaſt, or more in the centre of the country, to feu out as much of his eſtate in gardens as he can get perſons to engage to build houſes upon, agreeable to a plan fixed upon by the proprietor; the feuers always being at the expence of building every one his own houſe, incloſing his garden and improving it. Thus the proprietor will find it much for his intereſt, whether in the neighbourhood of a city or town, whether the land be improved or not. Even a muir, if he only feus a part, it will increaſe the value of what remains; and if he can get the whole of his eſtate feued out, it would be better for himſelf, and the nation at large. Although this is not to be expected till perhaps an age or two hence.

If the noblemen and gentlemen were to adopt Lord Gardenſton's plan, mentioned in Mr John Knox's tour through the Highlands of Scotland, 1787, page 90, where he ſays, "I made public advertiſements, that future "ſettlers, who ſhould build and make out "their garden in any village-lot, without "any farm, ſhould be entitled to poſſeſs free

"of

" of rent for the firſt ſeven years. This en-
" couragement had the intended effect; and
" now my ground for village-lots is alſo ex-
" hauſted; ſo that I am obliged to treat for
" my tenants for land to accommodate new
" ſettlers, who now offer more than ever."
If once this came to be univerſally reduced to practice, the increaſe of feuers and villagers would be very rapid, and no perſon hurt. What is it that has made the buildings in London, Edinburgh, and other cities, increaſe in ſuch an extraordinary degree, and ſo very rapidly, but feus and long tacks. The ſame effects will be ſeen in every corner where feuing was once begun, though not ſo rapidly at firſt, nor ſo great in extent.

There was a very uncommon circumſtance that took place at Fort-William, the government took poſſeſſion of ſome ground there, belonging to his Grace the Duke of Gordon, the family being then popiſh, where they built the fort. Not many years ago they agreed to pay rent for what ground the fort took up, together with the gardens and incloſures; which they are about making purchaſe of from the preſent Duke of Gordon.

What is ſtill more ſurpriſing, there is juſt

now

now a large village built to the weſtward of the fort called Maryſburgh, now Gordonſburgh, without any liberty from that noble family. I am informed, that there are about three hundred families, who built houſes and diſpoſed of them to one another without any diſpoſition from the proprietor.

The preſent Duke of Gordon was ſo generous as to take no advantage of this. His Grace, within theſe few years has given all of them feus upon very eaſy terms. By the feus being low, the village is increaſing every year, and will continue ſo to do for many years; ſo that there is no ſaying how much it will turn to.

From the examples of the two noble patriots above-mentioned, who merit much praiſe, we may learn what are the moſt effectual means for raiſing villages very rapidly; which is to give every feuer or tackſman a houſe and large garden ſeven years free of rent, and at the expiration of that time, the rents to be moderate, either a perpetual feu, or a long tack for a hundred years; and at the expiration of every hundredth year, the tack to be renewed for another hundred, upon the tenant's paying two rents advance; and ſo to continue

continue in this way for ever. This is Lord Gardenſton's method of granting his tacks.

If once this practice of feuing came to be generally followed, it would increaſe population very much, and would be a nurſery both for the navy and army.

The ſuperior advantage of every perſon building his own houſe, and incloſing his garden, to any other ſcheme as yet propoſed, for the improvement of the fiſheries, is ſo great and ſo permanent, that it needs little argument to prove it. It may be aſked, Where are the people to be got that are able to build their own houſes, and to carry on the fiſhery? The anſwer is ſhort, Give proper encouragement by feus, or long tacks, rent free for the firſt ſeven years. This, with the view of the profits that can be made by the fiſheries, will induce many perſons, from different quarters unexpected, to come and ſettle there. It only needs to be once begun.

What made ſo many perſons emigrate to America? From the report that they would get ground to improve for little or no rent.

There are many perſons with ſmall capitals would ſettle in theſe villages, in order to buy

buy fiſh from the natives, and to ſerve them in proviſions, nets, or twine, barrels, &c. The natives would, in a few years, ſave as much money as would build a houſe and garden; and when once ſettled, having a ſmall property they could call their own, would never think of removing; and when once begun to make a little money of the fiſhing, would encourage others to come and ſettle there alſo.

If the Britiſh ſociety inclined, in order to encourage the building, to give all the wood wanted for each houſe, for intereſt for ſeven years, they could never be loſers, when the feuers are at all the expence for maſon and wright work, &c.

But ſuppoſe the company were inclined to build all the houſes themſelves, and let them out for rent; this would not be ſo certain a plan, as ſome part of the rents would be ſtill unpaid. As ſoon as they were much in arrears, many perſons would be tempted to leave the place altogether. Whereas, were every one to build his own houſe, and to have families, it would be like a teather-ſtake to keep them in one place.

Whenever a perſon gets, or contracts a diſ-

poſition

poſition of roving about from place to place, he is not ſo much to be depended upon, neither has he ſuch a regard for his own character, as one that is ſettled in one place. By having a cow, with a large garden, with different roots, greens, and potatoes, would be the means of living comfortably at little expence, and would find employment for both men and women, when not engaged in the fiſhing; and when fully improved would raiſe part corns. The larger the garden the better at firſt. Although the ground was but poor, it would be yearly turning richer, having ſuch a command of manure, and wholly laboured with the ſpade.

Whenever the village was built, having a number of houſes and gardens, in order to excite induſtry, and raiſe a ſpirit of emulation, to improve their gardens moſt rapidly, and raiſe the greateſt crops of every thing the garden produced; it is propoſed, that there ſhould be two premiums given annually, one of ten pounds, and the other of five; but no perſon to receive the ten pounds but once, till ſuch time as it went over the whole village. The perſon who gained the five pounds might contend for the ten pounds next year. This

would

would have wonderful effects to quicken induſtry and ingenuity. And if once the village got into good reputation of the feuers living comfortably, and ſaving a little money, would ſoon increaſe, perhaps to ten or twenty times its ſize, or more.

And ſtill further for encouragement, let all garden-ſeeds be given them for the firſt two or three years gratis; ſuch as cabbage-ſeed, different kinds of greens or kail, turnip, onions, carrots, leeks, potatoes, red and white clover-ſeeds; and only to thoſe who agreed to follow the regular rotation of crops, as mentioned in National Improvements, page 270. Likewiſe a few ſlips of gooſberry and currant buſhes, and fruit trees.

All that the Britiſh ſociety, or any proprietor that chuſes to feu out ground for villages, have to do, is to build a pier, large warehouſes to hold ſalt, barrels, nets, and wood, &c. The whole of the herrings, or cod-fiſh, to be repacked at theſe warehouſes, and carefully examined by an inſpector appointed for the purpoſe. The name of the village marked with a burning iron upon each caſk. This is very neceſſary in order to prevent frauds,

 and

and to raiſe a good character to the fiſh when ſent abroad. Every village would ſtrive to obtain the beſt character.

This inſpector to have the charge of the whole warehouſes. Every veſſel to pay a ſmall duty for ſhore-dues and warehouſe rent; part of which to go to the inſpector's ſalary, and the other part to the proprietors, in order to indemnify them in part for the expence of buildings, &c.

If any of the fiſh was found at a foreign market not properly cured, both the inſpector and the proprietor of the fiſh to be ſubjected to a fine.

It would certainly be advantageous to the nation in general, and to the landholders in particular, if every proprietor in Britain was to plan out villages upon every part of their eſtates, where the ſituation is agreeable, and the ſoil and water good.

When the ground for one village was all let, another, at ſome diſtance from it, ſhould be immediately planned out; ſo that every year there would be lots to be feued.

This would not only increaſe the rent of every eſtate, but alſo increaſe the national produce and population. And the proprietor

tor would be certain of his rents being well paid, and collected at little expence.

If the plan was good, and the terms reaſonable, perſons would probably be found, who would contract for all the lots of a village; and by thus proceeding on a large ſcale, they would be able to ſell them cheaper than individuals could erect a ſingle houſe for themſelves.

This would encourage many perſons to purchaſe, as they would know the expence before they entered.

Or perhaps, ſome monied perſons would chooſe to lay out their money on ſuch villages, and let the houſes.

When eſtates are to be ſold off, it would be an eligible method to feu out the whole in ſmall lots. It would be for the intereſt of creditors to adopt this method, at the ſame time, a ſaving might be made in favour of the proprietor.

How much waſte ground is there in Britain, in muirs, and upon the face of hills, that would anſwer very well for gardens, when laboured with the ſpade; having always the one half, or two-thirds in ſown graſs, which would maintain one or two

cows,

cows. What remained to be laboured would be but ſmall, at the ſame time, the crops would be extraordinarily great.

Extract from the Huſbandry of the Antients, page 176.

" Cato ſays, If you aſk me what kind of " farm is beſt, I will anſwer in this manner. " Suppoſe one ſhould buy an hundred juge- " ra properly ſituated; of all fields the vine- " yard is the beſt, if it produces plenty of " good vines. In the ſecond place, is a gar- " den that can be watered. In the third " place, a willow-grove. In the fourth, an " olive-field. In the fifth, a meadow. In " the ſixth, a corn-field. In the ſeventh, a " wood that grows up again after it is cut. " In the eight, a field planted with trees for " vines. And in the ninth, a wood for " maſts."

Although this is not a country for vines, yet a great variety of fruit trees, and berries of different kinds anſwer well. The gardens might be ſo planned out, that the water could be let on and off at pleaſure.

This extract, however, ſhews, that the Romans were in the practice of watering their gardens, which would benefit them much.

Multiplying

Multiplying the number of villages in every part of the country would tend to increaſe manufactures, and would anſwer a better purpoſe than erecting new colonies abroad.

How many proprietors have ten times more land than they can improve; which not only is a hurt to themſelves, but the nation in general. A ſmall eſtate or farm well improved, is far better, and more profitable, than a large extent of ground, when the cultivation is neglected.

The following quotation from the Huſbandry of the Antients, page 193, tends to illuſtrate this.

" Pliny ſays, The antients were of opinion, " that above all things, the large extent of " farms ought to be kept within proper " bounds. Wherefore, it was a maxim a- " mong them, to ſow leſs, and plow bet- " ter."

" Columella ſays, in ſpeaking of farms, To " the other precepts we add this, which one " of the ſeven wiſe men has pronounced as a " maxim that holds true in all ages, That " there ought to be limits, and meaſures of " things; and this ought to be underſtood

" as

" as applied not only to thoſe that do any o-
" ther buſineſs, but alſo thoſe that buy land,
" that they may not buy more than they are
" fully able for. To this is applicable the
" famous ſentence of our poet, You may
" admire a large farm, but cultivate a ſmall
" one; which antient precept the moſt learn-
" ed man, in my opinion, expreſſes in num-
" bers. This too is agreeable to an acknow-
" ledged maxim of the Carthaginians, a very
" acute nation, That the land ought to be
" weaker than the huſbandman; for when
" they ſtruggle, ſhould the farm prevail, the
" maſter muſt be ruined. And indeed, there
" is no doubt, but a ſmall field well culti-
" vated produces more than a large field ill
" cultivated."

The great extent of waſte ground in every county of Britain, is a proof, that it is neceſſary the legiſlature ſhould encourage and enforce improvements in agriculture.

A part of the amazing ſums raiſed in England every year for the poors-rates, might be appropriated for erecting villages and gardens, for lodging and maintaining the poor; by which they might be maintained at half the expence they are at preſent, and probably

with

with much wholeſomer proviſions. This is more fully handled in National Improvements, Vide p. 261.

If the crown lands were divided into lots for villages, or ſmall farms, and ſold for a ſmall quit-rent, payable yearly to government, the produce, population, and annual revenue of the nation, would be conſiderably increaſed.

If government were to erect villages, with gardens, for the diſabled ſoldiers and ſailors, conſiderable tracts of waſte ground might be cultivated by them, as almoſt all of them are able in ſome ſmall meaſure to labour. This is more fully treated off in National Improvements, p. 266.

In ſuch villages the men could live comfortably, and perhaps ſave the penſions which they receive from government. And were ſuch a reward held out to the veteran who was diſabled in his country's ſervice, it is probable the army and navy might obtain recruits, with much greater eaſe than they do at preſent.

The following extract from National Improvements, p. 390. exhibits a view of ſuch

" villages

villages as the author apprehends would fully anſwer the above purpoſes.

" Having ſaid ſo much about the con-
" ſtructing of new villages, in pages 250 and
" 339, it is needleſs to be repeating what is
" there ſaid: But as it is of ſo much conſe-
" quence that a village ſhould be properly
" planned out at the beginning, the ſucceſs
" depending greatly upon it, I ſhall here ſub-
" join a method how, in my view, it might
" be planned, and to advantage; it being as
" eaſy a matter to follow a good plan as a
" bad one.

" The regularity and neatneſs of a village,
" (each feuer having his houſe and incloſure
" whether great or ſmall, diſtinct by itſelf,)
" would be the means of drawing a conſider-
" able number of feuers, of different kinds
" of manufacturers, to ſettle there, and
" more eſpecially if the ground was impro-
" ved, and all thrown into graſs by the pro-
" prietor before entry, as propoſed in page
" 340.

" If once a proper plan was fixed upon, the
" moſt effectual method of carrying it into
" execution, would be for the proprietor to
" trench it all himſelf, and lime and throw

" it

A plan of one Village or four connect

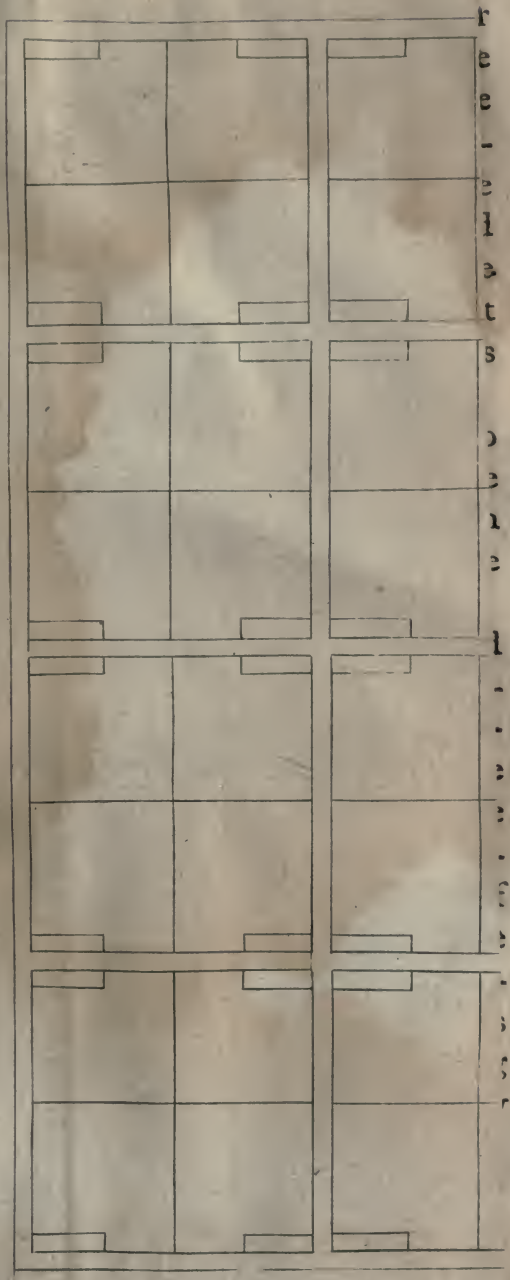
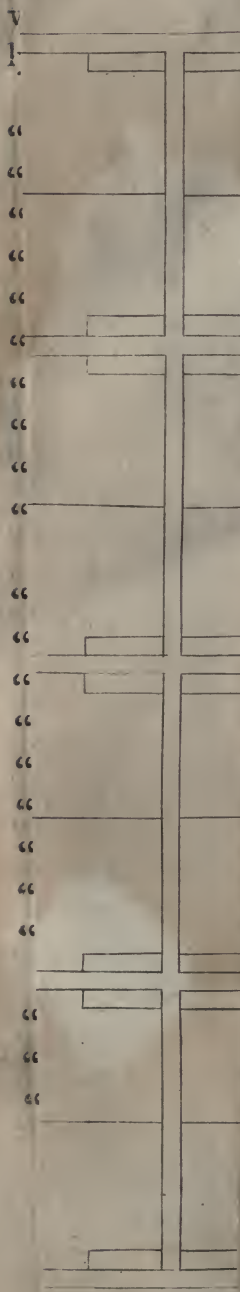


Plate II to face 5

ed together, or



" it into grafs; and by taking the three or
" four crops propofed, it would do more
" than indemnify the proprietor for his whole
" expence. It would be a great encourage-
" ment to the feuers, when they faw the
" ground brought in to their hand, and
" knew what good crops it produced before
" their entry, and that the ground was not
" exhaufted, having only taken two crops
" after liming, before thrown into grafs.

" As the whole village was thrown into
" grafs before it was feued out, it would be
" an eafy matter for the proprietor to form
" his plan, how it fhould be cropt for the
" firft ten years.

" The feuer ought to labour his ground
" only with the fpade, unlefs he had as ma-
" ny parks as would keep two horfes con-
" ftantly employed. The proprietor, as he
" had no connection with building the
" houfes, could carry on the trenching, in-
" clofing, and liming, to a great extent, if
" once begun and perfevered in; and there
" would be no difficulty to get as many feu-
" ers as would take it, and build their houfes
" at their own expence, the feu-duty being

" only propoſed to be ten ſhillings an acre
" for muir ground.

" Although the proprietor was to take the
" feuers bound to improve their land, it
" would be difficult to make a number of
" them to follow one plan; and if any failed
" in their ſchemes, it would be diſcouraging
" others to ſettle there. But when the ground
" was improved to their hand, there would
" be little difficulty to get them to follow one
" plan for the firſt ten years; and when they
" ſaw that that plan turned out to their in-
" tereſt, they would perſevere in it; and af-
" ter that they might be left to do as they
" thought proper.

" To ſhow fully how I propoſe to erect
" new villages or farms, I have repreſented
" in page 393, the plan of a village, or four
" connected together. You may ſuppoſe the
" ſquare to be what you pleaſe: If you ſup-
" poſe that each houſe is to have two acres
" and a half, then the firſt village will be on-
" ly forty acres, which is divided into ſix-
" teen parts, as is marked upon the plan;
" the other three villages of the ſame ſize,
" which in whole make one hundred and
" ſixty acres.

" If

" If you ſuppoſe five acres to each houſe, " the firſt village would be eighty acres, and " the other three of the ſame ſize, which in " whole would be three hundred and twen- " ty.

" If you ſuppoſe each houſe to have $6\frac{1}{4}$ " acres, then the firſt village would be one " hundred acres divided into ſixteen parts, " and the other three of the ſame ſize; which " would be in whole four hundred acres, " and ſo on in proportion whether for great " or ſmall villages or farms. The ſtreets in " each village croſs each other at right angles, " as may be ſeen in the Plan.

" The plan propoſed for reſtricting the feu- " ers for the firſt ten years, the whole being " in graſs at their entry at the commence- " ment of their feus—To have the one half " in graſs, and the other in tillage, and to " keep by the ſame rotation before mention- " ed, viz. 1ſt, oats after graſs; 2d, drilled " beans or peaſe; 3d, wheat; 4th, peaſe, " beans, turnip, potatoes, cabbage, or greens, " to be well dunged, which would anſwer " wholly for a garden; 5th, barley and graſs " ſeeds.

" As all this is propoſed to be moſtly done

" with

" with the ſpade, the whole of the corn might
" be ſown in drills, and covered with the
" machine mentioned.

" If there were a conſiderable number of
" feuers, the proprietor might give a yearly
" premium of L. 5 to him who had the
" greateſt number of bolls; none to be en-
" titled to this premium more than once.
" This would have the good effect of cauſ-
" ing each to exert himſelf towards the im-
" provement of his ground, ſuperior to that
" of his neighbours.

" It is a very difficult matter to make per-
" ſons alter their courſe of huſbandry all at
" once, though it ſhould be far better than
" the preſent; therefore, ſome means ſhould
" be uſed to induce them to adopt the pro-
" poſed plan, ſuch as appointing premiums;
" and when once they ſee it turn out to their
" intereſt, they will need no inducements to
" perſevere in it. So ſoon as the country
" ſees their ſucceſs, a great number will
" adopt that plan. But their ſucceſs much
" depends upon their ſetting out upon a pro-
" per plan, and getting encouragement at
" the beginning.

" This Plan alſo ſhews, what is the moſt
" regular

" regular way of dividing a farm, and the
" cheapeſt method of incloſing; and that the
" houſes ought to be placed in the centre of
" the farm, in order to ſave the expences of
" carrying the corn and dung, which is a
" great hindrance to the work about the
" farm, when improperly placed.

" In planning out a new farm, it is of great
" conſequence to have the incloſures ſo con-
" trived, that, by opening and ſhutting the
" gates, one of them may be divided into
" eight ſubdiviſions, and theſe ſubdiviſions
" made into one.

" By looking into the Plan, it will plainly
" appear, that if the farm-houſes are placed
" in the centre of any of the quarters, there
" will be ſixteen incloſures of ten acres each,
" at equal diſtances, around them; and if
" the houſes are placed in the centre of the
" four quarters, there will be ſixty-four in-
" cloſures of ten acres each around them,
" which make ſix hundred and forty acres in
" whole. It alſo ſhews, how theſe inclo-
" ſures may be enlarged, by having one in
" place of two; ſo that there would be eight
" incloſures around the houſes, containing
" each twenty acres; and if only into four
" incloſures,

" inclofures, it would be forty acres each,
" and fo on in proportion, according to the
" fize of the farm.

" Although there is only one houfe built
" upon each divifion, that does not hinder
" the feuer, if he profpers, to fill up the
" front with houfes; only he fhould be
" reftricted to have them all of one fize, ex-
" cepting the length, which may vary as the
" feuer finds it for his intereft. The ftreets
" ought to be thirty or forty feet wide. Al-
" though the beginning be fmall, there is
" no faying how large it may be through
" time."

The dominicales, lands formerly belonging to the kings of France, were, by order of Charlemain, rented in fmall parcels to little farmers, at a ninth part of their value. This philanthropy, as it raifed many induftrious families from want, contributed to the welfare of mankind.

If Britain was to follow the fame example, it would be attended with the fame happy confequences.

CONCLUSION.

CONCLUSION.

THERE now remains very little doubt with the Author, that every candid and intelligent perſon, who has carefully peruſed the foregoing treatiſe, will be convinced of the truth of what is there ſet forth. It requires but little attention to the preſent ſtate of agriculture in Britain to perceive that its produce might be increaſed to ten times the value, or perhaps to a ſtill greater amount. A demonſtrative proof of this may eaſily be had, only by taking a view of the many waſte, uncultivated, and ill-improved lands, with which the country abounds. Two obſtacles, however, occur to the execution of the plan propoſed in this work; the one ariſing from the incredulity and diffidence natural to mankind when any new ſcheme is propoſed; the other from their negligence and inattention to their real intereſt. With

regard

regard to the former, it ſeems entirely to ariſe from prejudice, or being unaccuſtomed to think of theſe matters. Very few have taken the pains to inquire what the real produce of Britain is, whether it be poſſible to increaſe it at all; or, if it be poſſible, what means ought to be taken for the purpoſe. To ſuch as are willing to inveſtigate the ſubject, this treatiſe will moſt probably give ſatisfaction, and convince them, not only that the produce of the Iſland in general might be increaſed in the above mentioned proportion; but, that no ſoil is ſo bad but it may receive conſiderable improvement, and, in a ſhort time, repay the expence laid out upon it.

The ſecond obſtacle ariſing from the general negligence and inattention almoſt univerſally prevalent, muſt be much more difficult to combat, and ſuch as no art nor pains of an individual can overcome. The great ſcheme propoſed in this treatiſe requires for its execution the united efforts of the whole nation; and, without the general concurrence of all ranks of men, each in their proper ſphere, there is not the leaſt hope of accompliſhing it.

As improvements in agriculture, muſt undoubtedly

doubtedly depend, in a great meaſure, on the conduct of the landholders, it is neceſſary to conſider, in the firſt place, what line of conduct they ought to follow, in order to make the moſt of their eſtates. Here, indeed, I am ſorry that any advice ſhould be neceſſary to the proprietor of an eſtate to reſide upon it. Such an advice, however, ſeems at preſent to be too much wanted, as the contrary practice of many gentlemen not only tends manifeſtly to the ruin of their own fortunes, but the general deſtruction of all with whom they are connected. Should it be aſked, What is the the beſt courſe of life for a nobleman or gentleman? What would tend moſt to his own intereſt, peace of mind, and to eſtabliſh a character of real patriotiſm, &c. The anſwer muſt be, To reſide upon his own eſtate; take proper meaſures to improve every part of it; and to live within his income, ſo that he might have, every year, a conſiderable ſum to beſtow on his tenants, for the purpoſes of improvement; to feu out villages, and to take care that there ſhould be few or no poor unprovided for. It is indeed the beſt, if not the only patriotiſm to be exerciſed in private life, to be diligent and regular in our appli-

cation to buſineſs, and careful in the management of our affairs. What pleaſure muſt it not give to a humane and civilized mind to view his dependants happy, to ſee the bleſſings of induſtry ſpread as far as his own influence extends, at the ſame time that he reaps the fruits of his laudable endeavours, not only by the increaſe of his fortune, but in being loved and eſteemed by all thoſe with whom he is connected! What an amazing fund of entertainment may a view of the works of nature afford to a ſpeculative mind, and what an excellent field for meditation and amuſement of the moſt innocent kind, while, along with the moſt ſublime mental enjoyment, the health of the body is promoted, and thoſe baneful diſeaſes, the effects of the confined and polluted air of a city, not to mention the ſtill more pernicious effects of diſſipation, are kept at a diſtance! Let this again be contraſted with the tormenting reflections attending the courſe of life, which too many of our gentlemen follow in London or Edinburgh, the real danger to which they are always expoſed, and the certain ruin which ſometimes overtakes them; and there is no perſon in

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the world, that can hesitate at giving the preference to the former.

It is not, however, to be supposed, that those who have habitually given themselves up to the neglect of every principle of religion or reason, will be influenced by what I or any other person can say. With such it is necessary that the legislature should interfere; and, as a parent corrects undutiful children, compel them to act for their own good, and that of the community in general.

A plan for this purpose was lately hinted to me by a gentleman of very considerable landed property, viz. That all proprietors of land should, by the legislative power, be obliged either to reside upon their estates, or to discount ten per cent of their real rents to their tenants, in order to enable them to go on with improvements in their absence. This would in a great measure counteract the evil, if it did not entirely remove it. And it is humbly hoped, that our present patriotic minister, who, on all occasions, has shewn himself so diligent in promoting the true interest of the country, will soon turn his attention towards the very important science of agri-

culture,

culture, and rescue it from that oppression under which it has so long groaned.

Another evil, scarcely, if at all inferior to what has been just mentioned, is the monopoly of land, both by the proprietor and the farmer.

What vast tracts of land do we not every day see in the possession of those who neither attempt to improve them, nor seem to have any inclination to do so; while the farmers, imitating the conduct of their superiors, seem to be ambitious each of possessing half a county, without considering how it should be improved; or, indeed, having it in their power to do so, by reason of the great extent of their farms. Thus the country is depopulated, and even the means of real improvement, should any person attempt it, rendered much more difficult to be procured than they ought to be.

This, like the former, can only be removed by the interference of the legislature. It has already been remarked, how careful the Romans were in the distribution of their lands in the infancy of the republic; how powerful they were while this continued; and what was the consequence of deviating

from

from the rules they had once laid down. It ſurely cannot be thought unworthy the attention of the Britiſh legiſlature to follow the example of a nation ſo wiſe, ſo politic, and ſo powerful.

Suppoſe a law were enacted, that no perſon ſhould purchaſe an additional quantity of land before he had improved the one half of what he already poſſeſſed; or that he ſhould be obliged to feu out his waſte grounds, at a moderate rate, to ſuch as were capable of improving them, if he did not chuſe to improve them himſelf. By this he could not poſſibly be hurt; but, on the contrary, would receive very great benefit, as the value of his lands would ſoon increaſe to more than double what it was before.

The mode of improvement, by keeping one half conſtantly in graſs, and the other in corn, might alſo be enforced by law; and thus a regular ſyſtem of agriculture, and national uniformity in its practice would take place, which could not but be attended with the moſt happy effects, both to gentlemen and farmers.

Gentlemen, by purchaſing large eſtates, not only hurt and depopulate the country, but

but injure their own intereſt alſo; for very few receive more than two and a half per cent. for their money; and it is thought extraordinary if they receive five. But by following the method of improvement here recommended, they might ſoon receive ten per cent. And the farmers would likewiſe find it for their intereſt to have no more land than their ſtock would allow them to improve.

Along with what is here recommended, the mode of giving premiums, as mentioned in the Treatiſe, or ſome other, to promote a more general attention to agriculture, would ſeem to be an object highly worthy of the notice of the Britiſh legiſlature. It is certain indeed, that without a hearty concurrence of every claſs of people, all encouragement that could be given by government, or by the proprietors of land, would be entirely vain.

The plan laid down in this treatiſe is univerſal. It is deſigned not only to promote the intereſt of thoſe who are already in eaſy circumſtances, but to increaſe the happineſs and comfort of every individual, whatever their ſituation may be.

The natural deſire which every perſon has

to

to enjoy a certain proportion of the comforts of life, muſt certainly awaken their attention to any propoſal which offers to make their ſituation more eaſy and agreeable. And, I believe, there never was any time when ſuch a propoſal ſeemed to be more neceſſary than at preſent. This is evident from the general ſpirit of adventure in the commercial way, which now ſo univerſally takes place among us. I need not ſay how precarious the ſucceſs of theſe adventures frequently is, and how often, even thoſe who ſeemed to proceed on the ſureſt foundation, involve not only themſelves, but others alſo in the moſt inextricable difficulties.

Adventures in trade, indeed, offer the perſon who engages in them a ſudden and great increaſe of money, and thus allure by that natural indolence which makes us dread long and continual employment of any kind. Any ſcheme, however, merely commercial, while it holds out golden views at a diſtance, often leaves the adventurer, in the mean time, deſtitute of the neceſſary means of ſubſiſtence. Thus his mind muſt be continually uneaſy and embarraſſed, as well by the thoughts of the preſent, as of keeping his credit for the

future.

future. Agriculture, on the other hand, though it offers no great wealth, or holds it out only as a diſtant proſpect, always aſſures us of the means of ſubſiſtence while we follow it, as well as of health and pleaſures entirely unknown to the manufacturer confined in an unhealthy workſhop, or the ſhopkeeper confined in his ſhop, who have ſcarce ever liberty to breathe the common air, or to ſee the light of the ſun.

We are not, however, to imagine, that agriculture is inconſiſtent with any kind of commerce or manufacture, uſeful or neceſſary to mankind. It has already been ſhewn that it is the foundation of theſe; and that by encouraging agriculture, we encourage alſo commerce and manufactures. It is evident, indeed, that all the people of a nation cannot be merchants or manufacturers; for, in that caſe, who ſhould buy the goods? But great numbers might cultivate the ground; and while they did ſo, the vaſt increaſe of population would undoubtedly raiſe a much greater demand for manufactures of all kinds, than even can be procured by the methods followed at preſent.

Should the plan of ſmall farms and villages come

come to be generally adopted, no perſon could be ſaid to want ſubſiſtence, while he had a cow and large garden; on the contrary, he would find himſelf able to live more comfortably, in a manner without money, than he could do when confined in a large city, even though he had conſiderable weekly wages. How many families are maintained in Ireland with potatoes and milk alone, and in the north of Scotland in the ſame way? And it ought to be particularly taken notice of, that where there is the greateſt quantity of milk, we always obſerve the people to be the moſt robuſt and healthy, as well as of the greateſt ſtature. I ſcarce need to add, that in large towns, this article ſo neceſſary and agreeable to the human body, is almoſt entirely denied, and the inhabitants in its ſtead accuſtom themſelves to the moſt pernicious liquors. When I aſked the Iriſh giant in Edinburgh what food he was brought up with when young? he anſwered bluntly, "Milk, Sir;" meaning cow's milk.

As the ſubject of this treatiſe, therefore, ſeems to be ſo intereſting to every individual, it would be of great conſequence to the nation, that the generality of its inhabitants

could only be brought to conſider what are the moſt proper plans for anſwering the ends propoſed. Could the public attention once be turned towards this moſt important point, there is no doubt but that ſome plan for the general good of the country would ſoon be adopted.

The author will not pretend to ſay, that the plans he has laid down are the beſt that could poſſibly be deviſed; but he is certain, that, were they followed, the wealth and population of the kingdom muſt very ſoon be conſiderably augmented. If any other, however, could be thought of, more eligible, or conducive to the public intereſt of the kingdom, he ſhould reckon himſelf happy in ſeeing them adopted, though every thing that he has recommended ſhould be entirely rejected.

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