THE

RURAL ECONOMY

OF

YORKSHIRE.

COMPRIZING THE

Management of Landed Eſtates,

AND THE

PRESENT PRACTICE of HUSBANDRY

IN THE

AGRICULTURAL DISTRICTS

OF THAT COUNTY.

By Mr. MARSHALL.

THE SECOND EDITION.

IN TWO VOLUMES.

VOL. I.

LONDON:

Printed for G. NICOL, Bookſeller to His Majeſty, Pall Mall;
G. G. and J. ROBINSON, Paternoſter Row;
and J. DEBRETT, Piccadilly.

M,DCC,XCVI.

ADVERTISEMENT.

FROM Norfolk *, I paſſed, in November 1782, through Lincolnſhire, into YORKSHIRE: where I ſpent ſix months: principally, in obſerving and regiſtering its Rural Practices: a taſk I was the better enabled to perform, in ſo ſhort a time, as my early youth was ſpent among them; and my acquaintance, with the preſent Practitioners, extenſive.

When I left the County, in May 1783, I conſidered myſelf poſſeſſed of Materials ſufficient for the purpoſe, which I had at that time in view. But, on digeſting my papers (after I had ſeen the Practice of Norfolk through the Preſs), I found many additions wanting, to render my Regiſter fit, as a ſeparate Work, for the public eye. I therefore paid this Country a ſecond agricultural viſit, in March laſt, (1787;) and have made a

 farther

* See the Preface to the RURAL ECONOMY of NORFOLK.

farther ſtay in it of nine months: during which time, I have not only filled up the deficiencies, I was aware of; but have received a greater influx of freſh information, than I had any reaſon to expect.

It was my intention, when I came into the County, to have made EXCURSIONS, into its ſeveral Diſtricts; but having found, in the immediate environs of the STATION, full employment for the time appropriated to the County, I am under the neceſſity of poſtponing the intended excurſions. I poſtpone them, however, with leſs regret; as, in acquiring a general knowledge of the RURAL ECONOMY of the KINGDOM, the primary object is to obtain, with fullneſs and accuracy, the *widely differing Practices* of STATIONS, choſen in DISTANT DEPARTMENTS. The *partial excellencies* of INTERMEDIATE DISTRICTS, howſoever deſirable they may be, are objects of a ſecondary nature.

PICKERING, 21 *December* 1787.
PUBLISHED, *March* 1788.

ADVER-

ADVERTISEMENT

TO THE

SECOND EDITION.

THE Surveys that have recently been made, under the Direction of the BOARD OF AGRICULTURE, have precluded the neceſſity of extending my Examinations, in this County.

I have, however, purpoſely refrained from profiting by theſe Surveys, in this Edition; as it is my intention to go through the whole of the Board's Reports, analytically, and to ſelect ſuch Notices, and Particulars of Practice, as may have eſcaped my own Obſervations, in the ſeveral Departments of the Kingdom. Indeed, it has been my deſire, in reviſing theſe Volumes, to *compreſs* them, rather than to *enlarge* their bulk, and to confine

confine them, as closely as I could, to MY OWN OBSERVATIONS on the ESTABLISHED PRACTICES of this Department.

For, it may be proper to remark, that, at the time these Volumes were written, the Completion of my General Design was in a state of great Uncertainty. I was therefore the more anxious to instil into them the practical Ideas, which a length of experience had furnished, but which had not been previously registered: and the precarious state of my health, at that time, was another motive for my wishing to incorporate them with the Practice I was then registering; more especially, perhaps, as it was the Practice of my native Country. But on revision, I have found them, in general, so firmly engrafted on the provincial practice of the District, as not to be separable from it, without violence. Some general Observations on the Extirpation of Weeds, being the chief part of the adventitious matter I have been able to separate, with strict propriety.

However,

However, in profecuting this deliberate Reviſal, I have been attentive to improve the general ARRANGEMENT of the Work, and have made ſuch other CORRECTIONS and ALTERATIONS, as Time and increaſing Experience have enabled me to make.

To each Volume, I have now prefixed an ANALYTIC TABLE OF CONTENTS; as well to give the Reader a comprehenſive View of the general Subject, with its various Diviſions and Ramifications, as to lighten, as much as poſſible, the Labor of Reference.

LONDON, *September*, 1796.

ANALYTIC

ANALYTIC TABLE

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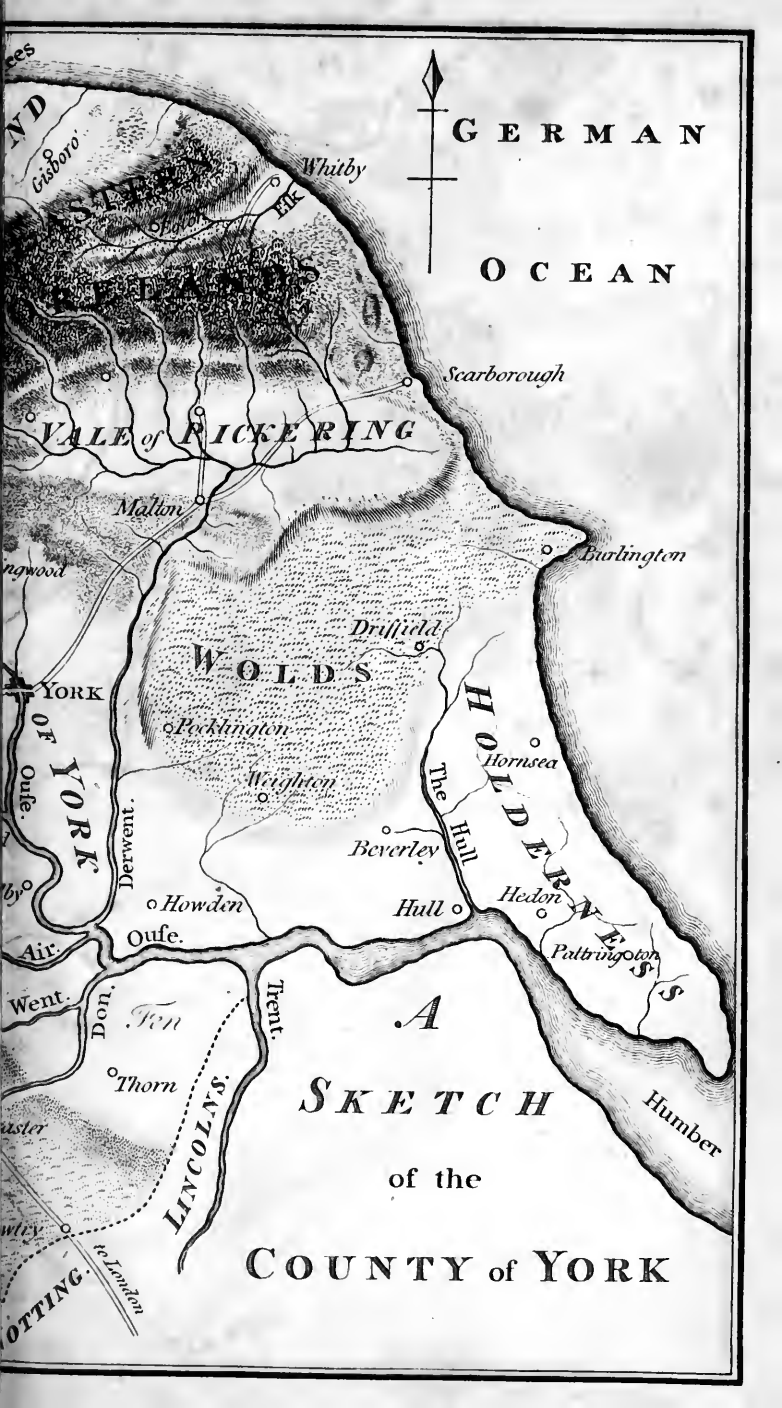
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THE

RURAL ECONOMY

OF

YORKSHIRE.

THE COUNTY

DIVIDED INTO

NATURAL DISTRICTS.

YORKSHIRE has always been ſpoken of as the firſt Province of theſe kingdoms. If we conſider its ſuperior magnitude; the variety and ſtrength of its natural features; the fertility of its ſoils; and the induſtry of its inhabitants; the abundance and copiouſneſs of its rivers; the richneſs of the views on their banks; and the wildneſs of thoſe which are found among its mountains;—it is well entitled to pre-eminence.

Viewed as a field of RURAL ECONOMY, it is divisible into MOUNTAIN, UPLAND, and VALE. The VALE OF YORK, falling gently, from the banks of the Tees, down to the conflux of the Trent and Humber, is Nature's grand division of the County, into EAST and WEST YORKSHIRE.

WEST YORKSHIRE naturally subdivides into mountains, which I shall term the WESTERN MORELANDS; into CRAVEN, a fertile corner cut off from the county of Lancaster; and into a various MANUFACTURING DISTRICT: EAST YORKSHIRE into CLEVELAND; the EASTERN MORELANDS; the VALE OF PICKERING and its surrounding banks; the WOLDS; and HOLDERNESS.

The WESTERN MORELANDS are links of the extensive chain of mountains, which rise with the Staffordshire Morelands, and continue through Derbyshire, Yorkshire, Westmoreland, and Cumberland, with but few interruptions, to the Highlands of Scotland. These mountains are covered with heath: but the vallies, which intersect them, are cultivated. Wensleydale, the largest of these vallies, is fertile; and abounds with romantic scenery.

CRAVEN

CRAVEN is well cultivated, and rich in ſoil, but not uniformly ſo; its ſurface being broken: it is neither a valley, a vale, nor a plain; nor does it fall under the idea of a mountainous or an upland country. It is ſmall, compared with the other Diſtricts of Weſt Yorkſhire.

The MANUFACTURING DISTRICT is ſtrongly featured. The northern and weſtern parts of it mix with barren mountains. The more ſouthern and eaſtern limb,—a lovely declivity ſhelving gently into the Vale of York—is rich and highly cultivated; excepting the moſt ſouthern extremity, which partakes of the ſandy hills of Nottinghamſhire; and excepting the mountains on its weſtern margin, which aſſimilate with thoſe of Derbyſhire.

The VALE OF YORK is various in fertility. The fens at its baſe, and a heathy plain, part of the ancient foreſt of Galtres, northeaſtward of the city of York, are drawbacks from its productiveneſs. In a general view, however, it has not, in this country, its equal. The vales of Glouceſter and Eveſham are more fertile, but leſs extenſive. The wide flat of country which lies between the hills of Surrey and Kent, and the Downs of Suſſex,

may vie with it in extent, but not in general fertility. If we eſtimate the Vale of York by the number and copiouſneſs of its rivers, and by the richneſs of its marginal banks, it would, perhaps, be difficult to equal it, in any country.

CLEVELAND is, in general appearance, a continuation and appendage of the Vale of York; there being no other natural diviſion between them, than what is given by an unperceived elevation of ſurface. The waters of the Vale of York fall into the Ouſe and Humber; thoſe of Cleveland into the Tees; which divides it from the county of Durham.

The EASTERN MORELANDS appear as a detached maſs of mountain, broken off from the BRITISH ALPS which have been mentioned. The northweſt limb of this fragment is an abrupt broken precipice:—at the top, a barren heath:—at the foot, the Vale of York, and the fertile plains of Cleveland. From the brink of this giant precipice, the Morelands dip gently ſouthward to the Vale of Pickering; on whoſe verge riſe, abruptly, a range of thin-ſoiled limeſtone heights; which, in a ſimilar manner, ſhelve gently into the Vale; forming its northern margin.

The

The VALE OF PICKERING is a ſingular paſſage of country. A lake left dry by nature. A baſon, formed by eminences on every ſide, ſave one narrow outlet of the waters, collected with in its area, and upon the adjacent hills. Nature, perhaps, never went ſo near to form a lake, without finiſhing the deſign. A dam of inconſiderable length acroſs the Derwent, near Malton, would deluge the entire Vale; and the firſt paſſage of the waters would, in all probability, be down the ſea cliffs, which are its eaſtern extremity *.

* Nevertheleſs, this natural unity, which, as a Diſtrict, is not to be equalled in the Iſland, for entireneſs, regularity, and diſtinctneſs of outline, has heretofore been *nameleſs!* The principal part of it lies within the Hundreds or Weapentakes, of PICKERING LITHE and RYDALL; both of which extend over and include large portions of the Eaſtern Morelands,—a mountainous barren Country,—while a ſmall part of it (ſouth of the Derwent) lies in the eaſtern Diviſion of the County. In the Treatiſe on Planting, &c. publiſhed ſome years ago, I named it the Vale of Derwent; but to this there was an objection; as the Derwent and the Rye (a branch of the Derwent) are common to the Diſtrict: beſide, it has been the practice of our anceſtors to name ſimilar paſſages of country, from towns which belong to them; as the VALE OF AYLESBURY, the VALE OF EVESHAM, the VALE OF TAUNTON, &c. And waving the privileges of antiquity and royalty,

The WOLDS of Yorkſhire appear as if, during ſome convulſion of nature, they had been ſevered (by the ſea-like Humber and its broad rich banks) from thoſe of Lincolnſhire. In the preſent ſtate of things, they may be conſidered as the main link, broken off from the chain of chalky hills, which is thrown irregularly over the more ſouthern provinces. The Yorkſhire Wolds are the Downs of Surrey, on a large ſcale. They are the moſt magnificent aſſemblage of chalky hills the Iſland affords. The features are large; the ſurface is billowy, but not broken; the ſwells reſembling Biſcayan waves half pacified. The *ground* in general is peculiarly graceful: *Wood* and *water* would render it moſt beautiful. Water is forbidden: but wood may be had at will: and it is extraordinary that the ſpirit of planting ſhould have broken out ſo late. Utility, as well as ornament, calls loudly for this obvious improvement.

HOLDERNESS, towards the Humber, is a low flat tract: the Marſhes of Lincolnſhire on

royalty, which attach themſelves to PICKERING; it claims, by its central ſituation, and the extenſiveneſs of its own parochial rights to the lands of the Vale, the diſtinction I have here aſſigned it. (1796.)

on a reduced ſcale. But the more central parts are diverſified in ſurface, and the upper margin, which forms the ſkirts of the Wold hills, is a lovely line of country. On one hand a fertile vale, abounding with wood and water: on the other, dry airy downs, riſing, with an eaſy aſcent, to the higheſt Wold.

THE COUNTY CONSIDERED, AS A SUBJECT OF RURAL SURVEY.

IN RIVERS, the County under ſurvey is ſingularly well ſupplied. The HUMBER, which might well be ſtyled the RIVER OF RIVERS, bounds it on the ſouth. The TEES forms its northern confine. The DON, the AIR, the WHARF, the OUSE, and the DERWENT riſe in its mountains, and wind through its plains. In a COMMERCIAL light, theſe rivers are objects of the firſt magnitude. The tide flows into the center of the county. Not only *Hull*, but *York*, *Tadcaſter*, *Ferrybridge* and *Doncaſter*, may be called INLAND PORTS. The Don is rendered navigable, to *Rotherham*, *Sheffield*; the Air, to *Leeds*, *Bradford*; the Calder, to *Wakefield* and to near *Halifax*; the Ouſe, to *Burroughbridge*; the Derwent, to *Malton*; the Hull, to *Driffield*,

at the foot of the Wolds; and the Tees, to *Yarm*, on the borders of Cleveland, at the head of the Vale of York.

If, with the natural advantages this county poſſeſſes in its rivers, we view thoſe which are given it by its MINES of coals, allum, iron, lead, copper; and its MANUFACTURES of woolens and iron wares; commerce appears to be ſingularly indebted to it; while to the SEA PORTS of WHITBY and SCARBOROUGH—as nurſeries of hardy ſeamen—the nation at large owe much.

But national policy and commerce make no part of the preſent deſign; unleſs when they are intimately connected with RURAL ECONOMICS. It therefore remains to view the county, as a SUBJECT of RURAL ECONOMY.

No country entirely mountainous, nor one which is diſturbed by manufacture, can be a fit ſubject of ſtudy, for rural knowledge. The WESTERN DIVISION of the County falls, chiefly, under one or other of theſe deſcriptions. There are no doubt lands, in Weſt Yorkſhire, which are highly cultivated; eſpecially about Doncaſter, toward Ferrybridge; a paſſage worth peruſing.

NATURAL

NATURAL AND ACQUIRED ADVANTAGES OF EAST YORKSHIRE.

BUT if we attend to the EASTERN DIVISION, we ſhall find collected, within comprehenſive limits, almoſt every deſcription of country which is intereſting in rural affairs. A rich, well cultivated plain; a group of almoſt barren mountains, inviting objects of improvement; a fertile vale, various in ſoil and cultivation; with a tract of chalky downs, terminating in a rich marſhland country: including graſs land of every claſs, and arable land of almoſt every deſcription. It is the Iſland in miniature.

Nor do theſe NATURAL ADVANTAGES, alone, render Eaſt Yorkſhire a deſirable object of ſtudy: the INDUSTRY OF ITS INHABITANTS makes them peculiarly attentive to MINUTIAL matters; while the SPIRIT OF IMPROVEMENT, which has lately diffuſed itſelf, among all ranks of men, renders this Diſtrict ſingularly eligible, as a field on which to trace the greater OUTLINES OF MANAGEMENT,

THE

THE

VALE OF PICKERING.

INTRODUCTORY VIEW

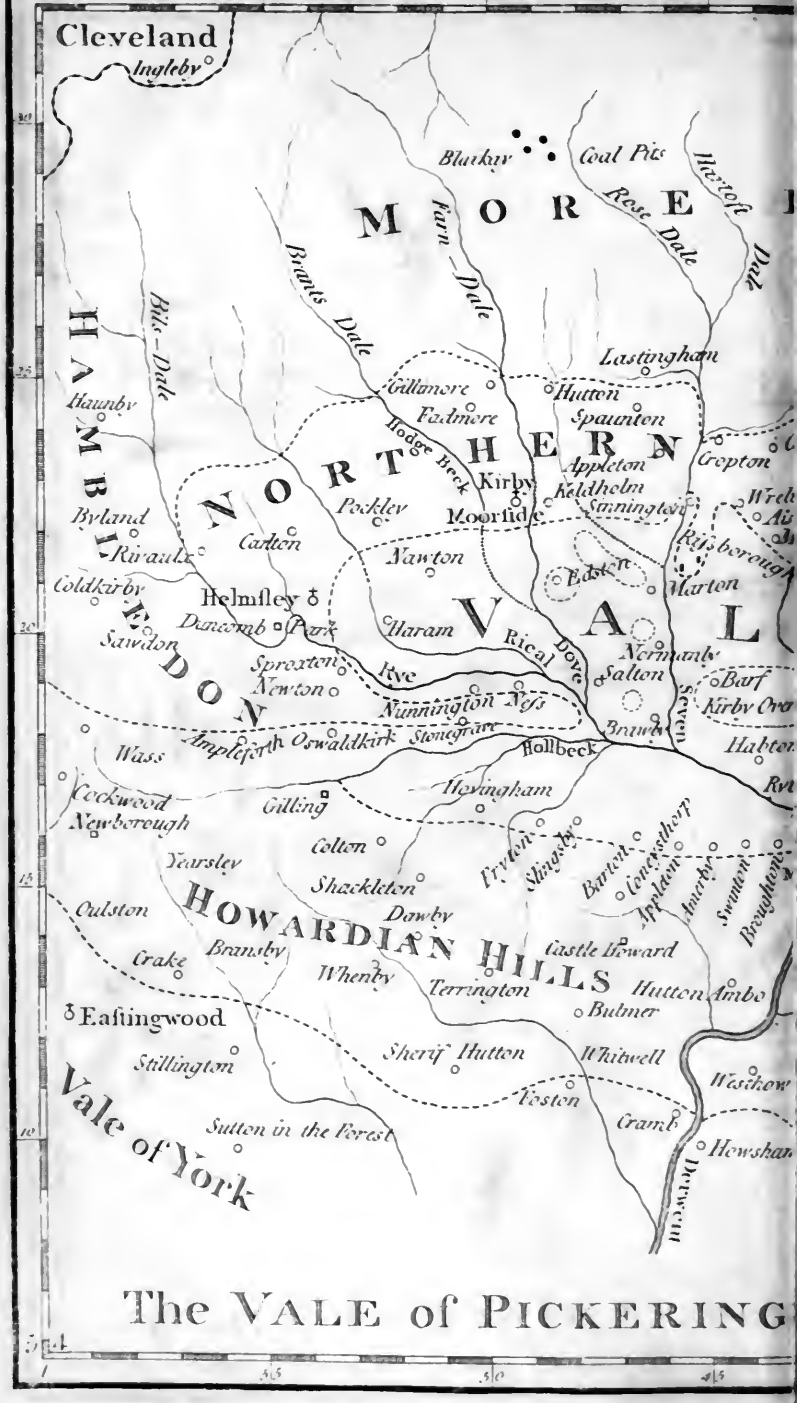
OF

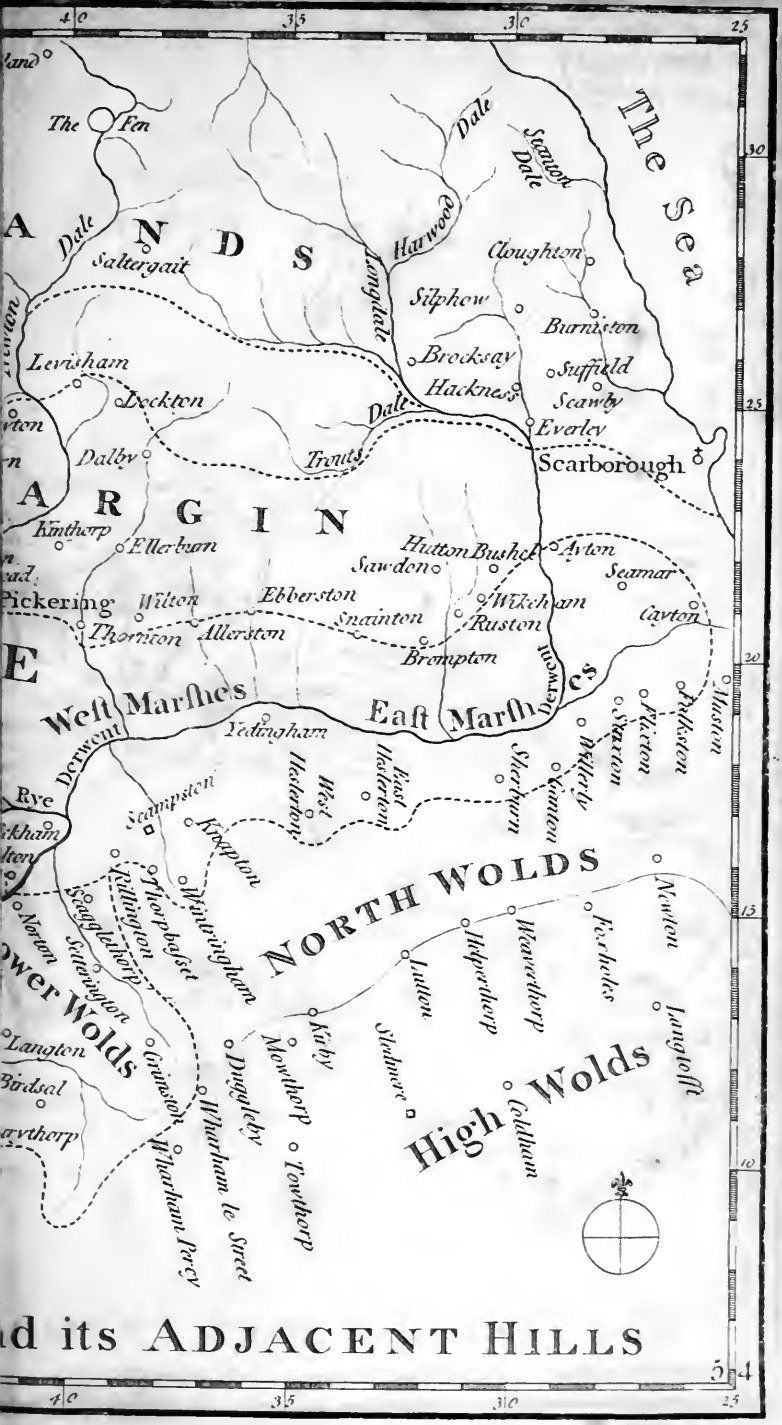
THIS DISTRICT.

I. SITUATION. The ſituation of this diviſion of Eaſt Yorkſhire has been already given. Its OUTLINE is ſomewhat oval.

II. The EXTENT of its larger diameter about thirtyfive miles; its greateſt width about twelve miles: including, in its area, and the cultivated lands which hang upon its banks, and which as property belongs to it, about three hundred ſquare miles, or 200,000 acres.

III. SURFACE and SOILS. The AREA of the Vale is extremely flat; nearly level; but being broken by hillocks, of different magnitudes, irregularly ſcattered,—and ſometimes


Cleveland
Inglebv
Blaikav
Coal Pits
Hurcroft
Rose Dale
Farn Dale
Brants Dale
Hills Dale
MOORE
HAMBLETON
NORTHERN
VALE
Lastingham
Gillamore
Hutton
Haunby
Fadmore
Spaunton
Hodge Beck
Cropton
Appleton
Kirby
Keldholm
Byland
Pockley
Moorfide
Stonington
Carlton
Rivaulx
Nawton
Coldkirby
Helmsley
Marton
Duncomb Park
Haram
Rical
Dove
Normanby
Sproxton
Rye
Salton
Newton
Nunnington
Nofs
Barf
Kirby Ore
Wass
Ampleforth
Oswaldkirk
Stonegrave
Hollbeck
Habton
Cockwood
Gilling
Hovingham
Newborough
Colton
Yearsley
Shackleton
Ivyton
Shingley
Barton
Leconsthorp
Appleton
Amotby
Swanton
Broughton
Oulston
Dawby
HOWARDIAN HILLS
Crake
Bransby
Castle Howard
Whenby
Terrington
Hutton Ambo
Eastingwood
Bulmer
Stillington
Sherif Hutton
Whitwell
Westhow
Foston
Sutton in the Forest
Cramb
Howshan
Vale of York
Derwent
The VALE of PICKERING



E. Mathews fc. Poppin Court

To be put in with a Guard between Pages 10 and 11.

times by promontories ſhooting from the marginal banks,—the eye can ſeldom judge either of its flatneſs or its extent.

Theſe HILLOCKS and HEADLANDS are invariably fertile; moſtly a fat clay: while the baſe on which they ſtand is either a rich ſandy loam; the common ſoil of the weſt end of the Vale; or an inferior clay, interſperſed with patches of moory ſoil: the prevailing ſoils of the marſhes, and carrs, of the Eaſtern diviſion.

The MARGINS are variouſly ſoiled. The ſkirts of the banks are moſtly a rich middle loam; dry, yet *cool* (how eligible for the ſites of villages!) but generally decreaſe in quality, with the riſe of the hills which back them *.

The face of the WOLD HILLS (which on this ſide are bold but not broken) terminates, at the ſummit, in a thin chalky loam; —the ſoil of Epſom and Banſtead Downs.

The range of hills which riſe at Malton, and fill up the ſpace between the Wolds and the Heights of Hambledon; which at preſent are without a name; but which I ſhall term the

* For the SUBSTRATA of the Vale, ſee the Section SOILS, and their MANAGEMENT.

the HOWARDIAN HILLS*; are lower and leſs abrupt; terminating in a various ſoil; covering a well grounded, well wooded, fine ſporting country;—the inferior hills of Kent.

The NORTHERN MARGIN riſes, in general, ſtill leſs abruptly; terminating in a thin limeſtone loam, lying on a chain of heights, broken by wooded vallies, and backed by the moreland hills; which are interſected by cultivated "dales," appendages of the "country" out of which they iſſue.

IV. The CLIMATURE of the Vale is *above* the latitude it lies in (54°.). The ſummer ſeaſons are three weeks, at leaſt, behind thoſe of the ſouthern provinces. What is remarkable, the ſeaſons on the ſouthern banks, about Malton, lying of courſe with a north aſpect, are forwarder, by more than a week, than thoſe of the northern margin, which lie full to the ſun. The ſubſtratum of both is the ſame; namely, Limeſtone Rock. The fact, perhaps, may be accounted for, by the pile of mountains which riſe behind the northern banks; and which, though they diſcharge rivers of water, ſtill retain at their baſes

* CASTLE HOWARD, the magnificent reſidence of HOWARD, EARL OF CARLISLE, is ſeated among theſe hillocks.

baſes a ſufficient quantity, to keep their ſkirts cool through the ſummer ſeaſon.

V. The RIVERS of the Vale are the DERWENT and the RYE; which, by receiving the waters of the *Coſta*, the *Seven*, the *Dove*, the *Riccal*, and other inferior brooks *, is more copious than the Derwent, at their conflux. The rivers have their riſe in the moreland mountains, are collected in the dales, and wind through the wooded vallies, into the area of the Vale; through which they move, with ſluggard pace, to their narrow outlet. As a proof of the flatneſs of the Vale, the waters of the Rye are ſome four or five days, in paſſing from Hemſley to Malton (about fourteen miles): and thoſe of the Derwent, not leſs than a week, in moving from Ayton (about fifteen miles) to the ſame general outlet. It is highly probable, that, in a ſtate of nature, a principal part of the Vale was ſubject to be overflowed. Even now,

* A remarkable circumſtance attends theſe brooks; all of which, from the Rye to the Coſta (the Seven in a dry ſummer not excepted) ſink (when at dead water) in the vallies between the Limeſtone Heights. Some of them riſe again in the ſame vallies in which they ſink: others diſappear entirely. In the time of floods they all occupy the channels, which nature has provided for them, on the ſurface; and which, in the annexed Sketch, are marked by dotted lines.

now, since rivers have been cut, and embankments made, extensive fields of water are still to be seen, in times of floods; not, however, through natural necessity, but for want of further exertions of art. By increasing embankments, and by removing obstructions natural and artificial *, the rivers, in their highest swell, might be kept within due bounds.

VI. INLAND NAVIGATION. The Derwent is made navigable to Malton; and might, without extraordinary expence, be continued so to Ayton; and the Rye and its branches might, with little exertion of art, be made navigable to Pickering, to near Kirkby, and to Hemsley. But a sequestered vale, without mines or manufactories †, and with two sea ports in its neighbourhood, and an inland port on its margin, requires the less assistance from internal water carriage. A removal of the present obstructions of the rivers is wanted, here, rather than more artificial ones. 1796.

* The cataract-like mill dam across the Derwent, at Old Malton, is a public nuisance which reflects disgrace on every man of property in the Vale. It appears as if intended to finish what nature has left undone!

† Excepting a manufactory of coarse linen, which prevails, more or less, I believe, through the several districts of East Yorkshire.

1796. Since the firſt edition of this Work was publiſhed, two ſchemes have been ſuggeſted, and ſurveys made, by oppoſing intereſts, for bringing ſea coals into the Vale, by means of inland navigation; the one from the port of Whitby, the other from that of Scarborough.

The latter is, by far, the moſt practicable. The baſe of the Vale is nearly level, from end to end, and the eaſt end of it is not exceſſively elevated above the tide; and its diſtance, from Scarborough, as appears on the map, is inconſiderable.

This ſhort aſcent being ſurmounted, the only difficulty would be paſſed. A canal, of ſeventy or eighty miles in circuit, might be run round the Vale, *without a lock!* and without injury to the courſes of the natural rivers.

The direction of ſuch a canal would be nearly that of the dotted line of the map annexed (though not traced for this purpoſe). It would of courſe ſupply four market towns, and upwards of fifty villages, with water carriage: not only of fuel, manures, farm produce, and timber; but of paſſengers,—on the Duke of Bridgwater's plan of ſtage boats: the cheapeſt and moſt eaſy mode of travelling.

From

From the weſt end of the Vale, a communication would not be difficult to make, with the canal, lately undertaken in the Vale of York; and thus open an inland communication, by water, between Scarborough, York, Hull, and the manufacturing diſtrict of Weſt Yorkſhire.

Should this Iſland continue to proſper, half a century longer, there can be little doubt of an improvement, ſo ſelfevidently great, being carried into effect.

VII. TOWNSHIPS. The feet of the marginal ſwells are ſtudded with TOWNS and VILLAGES; which, in ſome parts, are not a mile aſunder; but, in others, are farther diſtant, and leſs regular.

To theſe marginal TOWNSHIPS belong, generally, the lands of the Slope, with a portion of the area or bottom of the Vale; which, through this reaſon, is thinly inhabited. From the center, weſtward, a few villages are ſcattered; but from thence, eaſtward, the entire area, one townſhip excepted, is included within the townſhips of the margin.

VIII. STATE OF INCLOSURE. A century ago, the marginal townſhips lay, perhaps, entirely open; and there are veſtiges

tiges of common fields in the area of the Vale. The weſt marſhes, church property, have been longer under incloſure: and the central townſhips were probably incloſed, long before thoſe of the margin; the ſoils of that part being adapted to graſs; and while the ſurrounding country lay open, graſs land was of ſingular value. At preſent, the entire Vale may be ſaid to be in a ſtate of INCLOSURE; a ſubject which will be ſpoken of, fully, in its proper place.

IX. PRODUCE: wood, graſs, and corn: the two latter at preſent intermixt, from the center of the area to the ſummit of the marginal heights.

X. The wood, though abundant, being confined principally to the vallies of the margins, does not afford general ORNAMENT; nor even appear to the eye at a diſtance. On a near view, however, ſome of thoſe vallies contain great beauties. The ſituation of Rivaulx, the ſite of a dilapidated monaſtery, would ſatisfy the moſt craving eye. Were the extenſive woodlands, which theſe vallies contain, ſcattered on the boſoms of the ſurrounding hills, the Vale of Pickering would be a paſſage of country, as ſingular in point of beauty, as it is in natural ſituation.

THE

RURAL ECONOMY

OF

THIS DISTRICT.

DIVISION THE FIRST.

LANDED ESTATES,

AND THEIR

MANAGEMENT.

I.

ESTATES AND TENURES.

I. THE LANDS of the Vale are much in the hands of ſmall owners. The only large eſtate, which it contains, lies on its Weſtern margin; and this, for magnitude and intireneſs, is exceeded by few eſtates in the kingdom. The towns of Hemſley and Kirbymoorſide, with the villages in their neigh-

neighbourhoods, and an immenſe tract of Moreland, reaching to the verge of Cleveland, are included in the DUNCOMBE eſtate. The EARL OF SALISBURY has a conſiderable property ſcattered acroſs the richer part of the Vale, from Sinnington to Brawby: and there are ſome few other off eſtates of Noblemen, in different parts of the Diſtrict.

II. The CROWN ſtill retains, in right of the Dutchy of Lancaſter, ſome property in the antient foreſt of Pickering; and the ARCHBISHOP OF YORK has a conſiderable eſtate in the marſhes.

SIR WILLIAM ST. QUINTIN has a good property, about his reſidence at Scampſton, and ſome other Gentlemen have reſidences and property in the Vale.

But the major part of the lands of the Diſtrict are the property, and, in general, are in the occupation, of YEOMANRY; a circumſtance this, which it would be difficult to equal in ſo large a Diſtrict. The townſhip of *Pickering* is a ſingular inſtance. It contains about three hundred freeholders, principally occupying their own ſmall eſtates; many of which have fallen down, by lineal deſcent, from the original purchaſers. No great man, nor ſcarcely a Country Gentleman,

has yet been able to get a footing in the parish; or, if any one has, the custom of portioning younger sons and daughters, by a division of lands, has reduced to its original atoms the estate which may have been accumulated. At present, no man is owner of three hundred pounds, a year, landed estate, lying within the township; although its rental, were it rack-rented, would not be less than six or seven thousand pounds.

III. The prevailing TENURE is FREEHOLD; which, however, is in many cases subjected to a small *free-rent*, reserved by the Crown, or the feudal lords of which it has been originally purchased. In Pickering, which is still held by the Crown as part of the Dutchy of Lancaster, the free-rent of the township is 28l. 13s. which is received annually, by the freeholders in rotation, and paid, in part, into the hands of the lessees of the Crown; the remainder, I understand, to the heirs of the late Lord Feversham *.

The COPYHOLD tenure is less prevalent, here, than in some other Districts: nevertheless,

* Part of the township, it is said, having been given up in discharge of monies advanced the Crown by a citizen of London; who, in parcelling it out, has reserved a free-rent of 8l. 2s. 6d.

theleſs, it occurs in different parts of the Vale.

The Weſt marſhes are principally under BISHOPS LEASE for three lives.

An antient PRIVILEGE, founded in conveniency or a degree of neceſſity, and eſtabliſhed in right by long cuſtom, ſtill remains evident in this Diſtrict. This privilege, which is here termed a *windrake*, and which, probably, heretofore was granted, and may ſtill be traceable, in different parts of the kingdom, gives the occupiers of one pariſh liberty to drive their cattle, to water, over the commons of another, which happen to lie between a meſſuage, hamlet, or village, and a brook or other convenient watering place; with, however, a proviſion, that the cattle ſo watered ſhall not be ſuffered to "couch and layer" on the ground driven over. But this original ſtipulation having in ſome caſes been neglected to be complied with, the windrake has, in time, grown into a right of commonage. An inſtance, wherein ſuch a right has been eſtabliſhed, will be mentioned under the article INCLOSURES.

2.

GENERAL MANAGEMENT OF ESTATES.

Prefatory Remarks.

THE LEADING PRINCIPLES of management, here, differ widely from thoſe which prevail in Norfolk *. Here, tenants are in full poſſeſſion of the farms they occupy; which, until of late years, they have been led, by indulgent treatment, to conſider as hereditary poſſeſſions; deſcending from father to ſon, through ſucceſſive generations; the inſertion of their names in the rent-roll having been conſidered as a tenure, almoſt as permanent and ſafe, as that given by a more formal admiſſion in a copyhold court.

One of the firſt eſtates in the Diſtrict afforded, ſome years ago, a ſtriking inſtance of this

* See THE RURAL ECONOMY of NORFOLK.

this indulgent treatment. In the early days of its late poſſeſſor, the tenants were not only ſuffered to *bequeath* their farms, to their reſpective relations, but to *ſell* the "good-will" of them, to ſtrangers.

The effects of this, perhaps, unprecedented indulgence were theſe: the happineſs of thouſands of individuals;—a reſpectability of character of the ſource of ſo much benevolence; a retardation of improvements in huſbandry; and, conſequently, a loſs of produce to the *preſent* community; this being one of the few inſtances I have met with, in which a lowneſs of rent has operated as a cauſe of indolence in the renter.

In the later part of life, this benevolent character, perceiving perhaps the evil effect of too great indulgence, or actuated by other motives, increaſed his rent roll ſome 50 *per cent.* But ſtill he preſerved his reſpectability: for his farms were ſtill moderately rented.

The preſent poſſeſſor has repeated the advance; but whether with equal propriety and equal credit, is a matter not neceſſary to be diſcuſſed in this place.

A ſimilar conduct has been purſued, on another conſiderable eſtate in the Vale, and with ſimilar effects. The firſt riſe was moderate,

derate, and made with judgment; the laſt ill judged and immoderate; intailing years of wretchedneſs on numbers, who had hitherto partaken of the common comforts of life *.

Theſe, and other inſtances which have fallen within my knowledge, are ſufficient evidences of the folly of deranging an eſtate, by exceſſive rents. Heretofore, the tenants on the eſtates above noticed, not only *kept up* exiſting erections, in proper repair, but *renewed* with ſubſtantial buildings; and made other improvements upon their reſpective farms, with the ſpirit of owners; conſidering them, in every reſpect, as their own eſtates; under a confidence that no advantage would be taken of ſuch improvements; but that they would remain with themſelves, and deſcend to their families.—Now, neceſſary repairs are neglected, buildings ſuffered to diminiſh, and improvements in huſbandry laid aſide; FOR ALL CONFIDENCE IS LOST: one riſe has not been thought ſufficient, and two may be thought too few. It is ſaid, and

* 1796. Fortunately for theſe tenants, though unfortunately for their Country, the rapid increaſe of paper money, and the conſequent increaſe of the prices of farm produce, has ſaved them from that extreme of poverty, which threatened them, at the time the above paſſage was written.

and I am afraid with truth, that the common good management of laying down lands with graſs ſeeds has been diſpenſed with, "for fear "the field ſhould look green, and the rent "of the farm be raiſed"!

Let this be as it may, it is abundantly evident, that both extremes, in the rate of rent, are prejudicial to an eſtate; and that in fixing a rental, as in all other human affairs, there is a HAPPY MEDIUM, which, though often difficult to find, always deſerves to be ſedulouſly ſought. No attention ought to be ſpared, in endeavouring to aſcertain the FAIR MEDIUM VALUE of an eſtate to be raiſed; for on this, only, the advance can be adjuſted with propriety.

It is evidently a want of policy, in the manager of an eſtate, to do any act which forfeits the confidence of TENANTS AT WILL. For, in this caſe, confidence is the only tie between landlord and tenant; and if a riſe of rent be neceſſary, it ſhould be made with judgment and moderation, and at one advance; that the neceſſary confidence may not be ſhaken, and the eſtate thereby rendered liable—*to the waſte of tenants at will, driven to deſpair.*

With

With a LESSEE, the caſe is different: the leaſe is, in this caſe, the tie: the maintenance of buildings, the uſage of lands, and the term of occupation, are fixt; and the reſponſibility of the tenant may, in this caſe, apologize for an exceſſive rent, though it will not always be found a guard againſt its evil effects. However, it may be fairly inferred, that an eſtate can, with propriety, be rented higher under leaſe, than at will: and further, that LEASES, OR A FIRM RELIANCE IN THE TENANTS, ON THE HEAD AND HEART OF THEIR LANDLORD, ARE, ON EVERY ESTATE, ABSOLUTELY NECESSARY TO IMPROVEMENTS IN HUSBANDRY.

It is not my intention to draw general inferences, unleſs they reſult aptly from facts under obſervation; and unleſs they tend to what appears to be an obvious improvement, in the general management of the Diſtrict under ſurvey. Nor is it my intention to *dictate*, or even to *recommend*, unleſs when ſuch improvements preſent themſelves to my mind, in ſtrong colours.

It appears, evidently, that, on the larger eſtates of this Diſtrict, the tenants (entirely at will) have loſt much of the confidence, which ought to ſubſiſt between landlord and tenant; and

and it ſtrikes me, clearly, that it would be good management, on ſuch eſtates, to grant leaſes, on the larger farms, and fix the ſmaller ones at ſuch rents, and under ſuch aſſurances, as will reſtore ſpirit and peace of mind to their occupiers.

The management of a landed eſtate is not a light matter; the proſperity and happineſs of the country it lies in, are nearly connected with it. And no other apology, I flatter myſelf, will be required for publiſhing the foregoing facts and reflections; or for venturing to recommend an innovation, which prudent management might have rendered unneceſſary.

The particular departments of management which require to be ſpoken to, under this head, are,

1. Manor Courts.
2. The Purchaſe of Lands.
3. Tenancy.
4. Length of Term.
5. Rent.
6. Covenants.
7. Removals.
8. Receiving.
9. Heads of Leaſe.

I. MANOR COURTS. Theſe antient ſources of the law of villagers are ſtill pretty generally kept open; even in manors where neither copyhold nor free-rent tenants remain; and where, of courſe, their legality is

diſ-

diſputable. Nevertheleſs, they have ſtill their uſes: the cleanſing of rivulets and common ſewers,—the repair of roads to grounds,—the ſufficiency of ring fences,—and the eſtimation of damages by impounded cattle,—the ſtocking of commons, and the removal of public nuiſances,—are matters which frequently require the interpoſition of a jury; who, in places where they are ſtill impanelled, are conſidered, not only as judges of the general welfare of the manor, but are frequently called in, as arbiters of private differences: and who are ſo fit to ſettle village diſputes, as a jury of neighbours, who have perſonal knowledge of the parties, and the ſubject matter in diſpute?

In a manor, where the lord has no intereſt in the well ordering of the lands and the inhabitants it contains, it might ſeem unreaſonable to oblige him to maintain a court, at his own expence; but if fines for non-appearance, and amerciaments for defaults, could be legally recovered, the extra charge, if any, would be ſmall, and might be borne by the county. And there appears to be no ſolid objection to a regulation, which would in the end be productive of public as well as private good: for whatever tends to the ad-

advancement of cultivation and the well ordering of ſociety, contributes to the virtue and proſperity of a Nation.

II. PURCHASE OF LANDS. From the multiplicity of ſmall eſtates, in this Diſtrict, frequent transfers of property take place; a market for land is always open, and the fair market price pretty accurately underſtood; conſequently, the FLUCTUATING VALUE OF LAND may here be obſerved, with advantage.

Some years ago, the price was extremely high; forty or fifty years purchaſe, upon a very high rent: lands not worth fifteen ſhillings an acre *rent* were ſold for forty pounds *purchaſe*. This, however, was not uniform, through the Diſtrict: for, at the time thoſe extravagant prices were given, in one part of the Vale, lands, of twice the rental value to a farmer, were ſold, in other parts of it, at exactly the ſame rate; though the diſtance between them is only a few miles; and in the ſame Diſtrict, ſimilar land is not, now, worth thirty pounds.

The cauſe of this diſparity is a proper ſubject of inveſtigation. The ſituation in one caſe is dry, with good roads; in the other low, and the roads deep and miry. *That*

is

is chiefly in the hands of ſmall owners—moſt of them monied men, and anxious to increaſe their *poſſeſſions: this* principally in the occupation of tenants. In *that* the rage of poſſeſſion had broken looſe, and ideal values had in conſequence been fixed to the lands on ſale; while the lands of *this* were *out of faſhion*, and of courſe neglected. A moveable commodity may be carried to the beſt market; but land can only be ſold at what is eſteemed the fair market price, in the place it happens to lie in.

Hence it ſeems to follow, that a perſon who wiſhes to purchaſe, at a cheap market, without regard to locality, ſhould look for a neglected Diſtrict, and endeavour to avoid the neighbourhood of ſmall owners, and that inordinate luſt of poſſeſſion, which is evidently epidemical, but not continual.

On the contrary, one who wants to ſell ſhould wait, if he can, until a *dear time* offer itſelf; or otherwiſe accept, perhaps to a diſadvantage, the *faſhionable price* of the day.

Theſe inferences, however, are more ſtrictly applicable to ſmall than to large purchaſes.

The

The preſent medial price of land, in this Diſtrict, is about thirty years purchaſe, upon a fair rental value; but varies much with the circumſtances it happens to be under.

III. TENANCY. Upon moſt of the larger eſtates LEASES are unknown; the farms have been let AT WILL, and held as hereditary poſſeſſions, through ſucceſſive generations. But it has been already obſerved, that the baſis, on which this ſpecies of tenancy formerly reſted, has of late years been ſapped, and is no longer ſufficiently ſecure, either for landlord or tenant.

In the marſhes, in which the Archbiſhop of York has conſiderable property, LEASES FOR LIVES is the ordinary tenancy; and there, it is obſervable, rapid improvements in huſbandry have been made. The farms are of a good ſize; and in the hands of men of property and ſpirit;—ranking, in every reſpect, with the ſuperior claſs of yeomanry. See FARMS.

IV. LENGTH OF TERM. Lime being the factitious manure of the Diſtrict; and upon old-incloſed land, the principal means of improvement; it may ſeem that a ſhort term would be here ſufficient. But if it be conſidered that the nature of much of

of the land, and the eſtabliſhed practice and produce of the country, require an alternacy of corn and paſture; *fourteen years* is a reaſonable term: if the price of labor and produce could be foreknown, twentyone years would, for the tenant, the eſtate, and the community, be more eligible.

V. RENT. Extremely high. In moſt parts of the Vale, much higher than even in Norfolk. There are lands under the ordinary courſe of huſbandry let, to farmers, at thirty to forty ſhillings an acre. In many parts of the kingdom the ſame lands would not let for two thirds of the price.

Theſe circumſtances imply a goodneſs of land, and a ſuperiority of management,—or improvidence on the part of the renter. The three may be concerned. The land is good, and the management, in one particular, excellent; and it is allowed, that to this piece of management is principally owing the preſent high rate of rent.

Formerly, it was the univerſal practice to plow with four oxen and two horſes, together with a plowman and one or two aſſiſtants. This extravagant plowteam is now univerſally reduced to two horſes and a plowman. It is at leaſt remarked, by men of obſervation

obſervation and judgment, that, without this ſaving in the mode of tillage, the preſent rents could not be borne.

It muſt be obſerved, however, that the lands, let at the above extravagant rents, lie in eligible ſituations, and are let in ſmall parcels. The larger farms lie, in general, in leſs eligible ſituations; and there are few, if any, ſo high as twenty ſhillings an acre.

To ſpeak of the medium rent of the Diſtrict would be vague; the rate of rent is, or ought to be, proportioned to the quality of ſoils; and lands worth from a pound to a penny an acre may, probably, be found on the ſame farm.

This variation of ſoil enables the obſervant cultivator to make accurate diſtinctions, in the expence of management and produce; and, conſequently, in the rental values of lands of different qualities: and this may account, in ſome meaſure, for the extraordinary eſtimation in which good land is held in the Diſtrict.

This diſtinction is, in general, too little attended to, upon large eſtates; the number of acres being, generally, too much regarded, and the quality of the ſoil too little. Maps

are convenient inſtruments in the hands of managers of eſtates; but unleſs they ſhew, with ſufficient accuracy, the *quality* and *ſituation*, as well as the *quantity* of the land they repreſent, they become dangerous guides in fixing a rental: an accurate valuation is much more eſtimable than a handſome map. The art of ſurveying may be learnt in a ſchool; but the judgment requiſite in the valuation of lands can only be obtained, by great experience in the field, and by ſome conſiderable ſhare of knowledge of the particular kind of land to be valued.

VI. COVENANTS. Under the old tenancy, *repairs* were done, and new erections made, entirely by the tenants, landlord allowing timber; and, on ſome extraordinary occaſions, a ſum certain towards the workmanſhip and the other materials.

Gates and *hedges* were entirely under the management of the tenant; landlord allowing timber for the gates and dead fences, as well as for *implements*, uſed upon the farm; alſo hedging ſtuff and bruſhwood, for *fuel*.

The management of the *land*, too, was left to the tenant, who plowed and cropt it, in the ſame manner as he would in all probability have done, had it been his own eſtate.

While

While the neceſſary confidence on the part of the tenants remained, theſe principles of management were abundantly ſufficient. The tenants took care of the eſtate as their own; the landlord's only care being directed to the annual receipt of the rent. But finding the tenants alarmed, and ſome of them no doubt diſſatisfied, with the recent additions of rent, it was thought prudent to introduce new regulations, reſpecting timber and the management of lands. Woodlands have been incloſed, and woodwards appointed. The plow has been reſtrained, and particular crops prohibited.

VII. REMOVALS. The TIME of the removal of tenants, here, is invariably Old Ladyday.

By the cuſtom of *this* country, tenants at will are allowed to clear the premiſes, previous to the day of removal, of *hay*, *ſtraw*, and *manure!* quitting the farm, on that day, and leaving it entirely naked of every thing, except the *wheat on the ground*; which, at harveſt, he reaps *and carries off!* paying only for the "on-ſtand," or rent of the land which the wheat has occupied *.

* Barley ſown before Ladyday, *on fallow*, is alſo the tenant's, paying the incoming tenant for the on-ſtand only.

Fortunately, however, for all parties concerned, removals have, until very lately, been little practiſed in the Vale: for a worſe time, or a worſe mode, could ſcarcely be deviſed. Old Ladyday is the middle of ſpring ſeed-time;—ſtock are ſtill in the houſe;—the hay and ſtraw partly eaten, and in part to eat;—and, at that time of the year, the roads, having been ſoaked and cut up, during winter, and ſtiffened by the winds of March, are in their very worſt ſtate. Theſe are diſadvantages to the outgoing tenant. The inconveniencies of an incoming tenant entering upon a farm, deſtitute of manure, and materials to raiſe it from, need not be enumerated.

In CLEVELAND, the time of removal is much more judicious. The incoming tenant takes poſſeſſion of the arable land at Candlemas,—of the paſture grounds at Ladyday, and of the mowing grounds at Mayday;—when the outgoing tenant quits every thing but the wheat.

Theſe regulations are admirably adapted to REMOVALS IN SPRING, and render them more eligible, in many reſpects, than MICHAELMAS REMOVALS; even when tempered with the NORFOLK regulations *.

Old

* See NORF. ECON. Art. FORM OF LEASE.

Old Michaelmas throws wheat ſeedtime too backward, and the unthraſhed corn incurs a long and frequently tedious connexion, between outgoing and incoming tenant: beſides, the hay, the turneps, the feedage of leys broken up, and of young clover after harveſt, make a long account between them: whereas, in Cleveland, the wheat on the ground, and perhaps a little remaining hay, are the only things to be valued (or removed), and the remaining wheat in the barn (if any) the only thing the outgoing tenant leaves behind him. If the barns be cleared by Mayday, which in general they may be without impropriety, the connexion between the outgoing and the incoming tenant (or landlord) diſſolves, entirely, on the day of removal; which, namely *Old* Mayday, is an eligible ſeaſon, and a leiſure time of the year.

The chief inconveniency, attending this mode of removal, is that of the incoming tenant (reſiding, perhaps, at a diſtance) putting in the ſpring crops. But there is no day in the year, on which this diſagreeable buſineſs can be done, without inconveniency to all parties; and all that can be done is, to find out ſuch days, and fix upon ſuch regu-

lations, as will reduce the inconveniency within the narroweſt bounds poſſible.

From the obſervations I have hitherto made, New Michaelmas with the Norfolk regulations, and Old Mayday with thoſe of Cleveland, appear to be the moſt eligible ſeaſons of removal.

VIII. RECEIVING. The TIME of receiving varies on different eſtates. On one, Candlemas for the Michaelmas rents, and Midſummer for thoſe of Ladyday, are the eſtabliſhed times; and were they adhered to, better days, for the purpoſe, need not be choſen; though in ſtrict propriety the firſt of March and the firſt of June might be ſtill better *. But to ſuit the conveniencies or the caprice of the receiver, the ordinary times are ſeldom adhered to, the tenants being left in a ſtate of uncertainty, as to the time of receipt; notices being ſometimes given and countermanded, repeatedly: a ſtate of embarraſſment this, to the tenants, which implies unpardonable management. On a large eſtate, the days of audit ſhould be as fixt and invariable, as the days of entrance and removal; and nothing but extraordinary circumſtances can warrant a deviation.

Upon

* See NORF. ECON. MIN. 47.

Upon another eſtate, ſtill more conſiderable than that above alluded to, the practice is to receive a few days after the rents become due; namely, about Ladyday and Michaelmas. Worſe ſeaſons would be difficult to fix upon.

With reſpect to the MODE of receiving, it is here reduced to the loweſt degree of ſimplicity. The tenants not only repair and fence, but pay the land-tax of their reſpective farms, which they rent at a ſum certain, ſubject to no deduction; conſequently, there are no accounts to be ſettled, nor any voucher to be examined.

IX. FORMS OF LEASES. It has been obſerved, that the leaſe is a ſpecies of tenancy uncommon in this Diſtrict: I know but of one eſtate on which it has been adopted; an off eſtate in the family of a Scotch nobleman. This eſtate is, I believe, principally under leaſes of fourteen years.

The form is not altogether excellent; but in ſome reſpects it is ſingular; and in others judicious. It exhibits the outline of management of that particular eſtate, and gives ſome idea of the Rural Economy of the Diſtrict. There are clauſes in it which many *good* tenants would object to; but there are others which are well adapted to

the preſervation of the eſtate, without appearing to be oppreſſive or diſgraceful to the tenant.

Leaſes are annually becoming more and more neceſſary; and it is my intention to adduce the forms of thoſe of different Diſtricts. The formation of a leaſe requires great circumſpection. A collection of digeſted clauſes will facilitate the taſk of drawing a new form, or improving an old one; and will at the ſame time produce, with the moſt ſubſtantial materials, a *compendium* of the general Management of Eſtates, in different parts of the kingdom.

LANDLORD AGREES to let;—certain ſpecified premiſes;—from Ladyday;—for a rent agreed upon;—during fourteen years, "and thence from year to year ſo long as (both parties) ſhall pleaſe."

ALSO, to put the buildings in tenantable repair.

LANDLORD RESERVES all mines, quarries, and royalties; timbers, and timber-like trees, ſpires and other trees;—with power to ſearch for, cut down, and carry away, at ſeaſonable times; together with full power of ſporting, &c. &c. (Tenant being allowed ſuch damages

as

as two indifferent perſons "of equal degree" ſhall determine.)

ALSO a power to enter upon the premiſes, from time to time, to view the repairs, and the condition thereof.

TENANT AGREES to take;—and to pay, without deduction (except the land tax) half-yearly; namely, at Michaelmas, and Lady-day (or within twenty days, demand being duly made), under forfeiture of the leaſe.

ALSO, to pay ſuch aſſeſſments, and to perform ſuch ſervices, duties, and cuſtoms, as are or ſhall be incumbent on the premiſes.

ALSO, to perform the cuſtomary leadings, or boondays, obſerved at the lord's principal manſion; ALSO "all other ſuits, ſervices, "duties, and cuſtoms of any kind, which "now are or ſhall at any time, during this "demiſe, be taxed, charged, or impoſed!"

ALSO, to obſerve all rules, orders, and bylaws of the courts leet and baron of the lord.

ALSO, not to let, nor ſuffer any perſon whomſoever to occupy, the whole or any part of the premiſes, "other than him "the ſaid (tenant) his executors or admini-"ſtrators, their or his wife or children;—or "a cow-gait to a cottager, holding under "the

"the lord;" — without ſpecial licence in writing.

ALSO, to keep the buildings, fences, and watercourſes in good repair; and to ſcour, yearly, ſuch ditches and watercourſes as landlord ſhall direct: provided the part ſo ſet out do not exceed one ſixth of the whole.

ALSO, not to cut down, ſhred, top, or lop timber or other trees; but to defend, from cattle, all trees and hedges.

ALSO, not to burn fern, nor furze, for aſhes for ſale, without conſent.

ALSO, not to ſow rape, hemp, flax, woad, weld, madder, or hops; nor more than a ſpecified quantity of potatoes, without leave.

ALSO, to hoe, properly, all lands ſown with turnep ſeed, and "to dreſs and weed "them according to good huſbandry,"— under the penalty of 10s. an acre.

ALSO, to ſpend on the premiſes all the graſs, hay, and ſtraw grown thereon.

ALSO, not to ſell nor carry off dung, or other manure.

ALSO, not to ſtock the premiſes with rabbits.

ALSO, not to ſuffer pigs to go looſe without being rung. But in all things to uſe the premiſes in a huſband-like manner.

ALSO,

ALSO, to reſort with his corn, grain, and griſt to his lord's mill.

ALSO, to employ ſuch mole-catchers, and vermin-killers, as landlord ſhall appoint or approve.

ALSO, not to obſtruct workmen, nor game-keepers, &c. &c.

ALSO, not to ſport, nor keep ſporting dogs, &c. &c. without leave in writing.

ALSO, *in the laſt year*, not to ſow more than one fourth of the arable land with wheat.

ALSO, *in the laſt year*, to ſuffer the oncoming tenant to enter, after Michaelmas, to ſcale and dreſs the graſs lands,—and to plow the arable for fallow, or for crops,—and to ſow and harrow,—without hindrance.

ALSO, *at the determination* of the demiſe, "whether by ſurrender, forfeiture, or other-"wiſe," to leave the laſt year's manure, ſtraw, dung, and compoſt.

ALSO, *to leave* in tenantable repair, and without waſte or ſpoil, all the houſes, buildings, fences, ditches, and banks; AND to diſcharge all taxes, and other outgoings due from the premiſes.

TENANT BINDS HIMSELF, &c. in a ſpecified

cified ſum for the due performance of the ſeveral covenants.

TENANT TO BE ALLOWED (*by award of arbitrators*) for the wheat of the laſt year:—to be valued in Auguſt or September, before it be cut:—deducting, from the eſtimate value, the rent of the land it may grow on, agreeably to a ſpecified valuation.

ALSO, for the turnep fallow of the laſt year.

ALSO, for the hay and ſtraw left unconſumed. AND for the manure of the laſt year; TOGETHER WITH the uſe of ſuch land as landlord ſhall appoint, for the conſumption of hay and ſtraw, *after the expiration of the term*, until Mayday.

ALSO, *during the term*, to be allowed limeſtone for the uſe of the farm; ſuch limeſtone being raiſed by the landlord, tenant paying fourpence, a waggon load, for raiſing them.

MUTUALLY AGREE that all unprovided-for diſputes ſhall be ſettled by arbitration.

3.

INCLOSURES.

THERE has, no doubt, been a time (and not perhaps many centuries paſt) when the entire country lay open; when common fields, common meadows, common paſtures, open woods, and extenſive foreſts and waſtes, were the only diviſion of lands, in this kingdom. Even the demeſne lands of the feudal lords appear to have, once, lain open with the lands of their tenants.

FITZHERBERT, who wrote about two hundred and fifty years ago *, ſpeaking of the herbage

* ANTHONY FITZHERBERT was Judge of the Court of Common Pleas, in the reign of Henry VIII. Beſide his *Natura Brevium*, Juſtice of Peace, and other works in the law, he left two on Rural Economy—the BOKE OF HUSBANDRY and the BOKE OF SURVEYING;—the firſt treatiſes, probably, which were written on the ſubject, in the Engliſh language; and the beſt that were written, for more than a century afterward. There has been ſome doubt about whether theſe two treatiſes were really written by *Judge* Fitzherbert; but I flatter myſelf I ſhall, in its proper place, be able to adduce ſufficient evidence of their being his productions.

herbage of townſhips, ſays, " by that is to be " underſtood the common paſture of the " town whereupon the herdman keepeth the " tenant's cattle; for it may be ſo good that " the tenants need not to have any ſeveral " paſture" [importing in this place ſtinted paſture]; " but that their common paſture " ſhould be able to find all their cattle, both " horſes, mares, beaſts, and ſheep: and ſo " it was of old time, that all the lands, mea- " dows, and paſtures lay open and uncloſed. " And then was their tenements much better " and cheaper than they be now; for the " moſt part of the lords have encloſed their " demeſne lands and meadows, and keep " them in ſeverałty; ſo that their tenants " have no common with them therein." In *this* ſtate the cultivated lands of the kingdom appear to have lain, in Fitzherbert's day. For in his laſt chapter, the ſubject of which is, " How to make a townſhip that is worth " twenty marks a-year worth twenty pounds " a-year," he recommends incloſure; — not as a known improvement to be perſevered in, but as a ſcheme eligible to be adopted.

In the preſent century, more eſpecially within the laſt fifty years, incloſure has made a rapid progreſs; and its effects have in general,

general, I believe, been equal to thoſe foreſeen by Fitzherbert. The garden is the higheſt ſtate of cultivation; open fields and common paſtures the loweſt; ſeparate incloſures a middle ſtate, which ſeems to be well adapted to the preſent population of this country.

Let this be as it may, the ſpirit of incloſure continues to be ſuch, that, in half a century more, an open field, or an undivided common may be rare, and the remembrance of them will of courſe ſoon wear away. This is therefore the proper time to regiſter intereſting facts, relative to the ſubject, and *this* Diſtrict the proper place for adducing them.

In my own remembrance, more than half the Vale under obſervation lay open: now, ſcarcely an open field, or an undivided common, remains. Beſides, the largeſt pariſh in the Vale—one of the moſt extenſive pariſhes in the kingdom—is now under incloſure; and the circumſtances attending it are ſuch, as have ſeldom occurred: a ſuitable opportunity, this, for endeavouring to aſcertain juſt ideas of a ſubject, which, though it has of late years been much agitated, appears to be, even yet, imperfectly underſtood.

In the beginning of the preſent century, the

the immediate townſhip of PICKERING remained in its ancient unincloſed ſtate.

Having been thought too large to be laid out conveniently as one townſhip, it had been judiciouſly ſplit into two diviſions, by a natural line, a conſiderable brook, which runs through it.

On each ſide of the brook lay a ſuite of COMMON FIELDS; three in number; for the unvarying round of wheat, &c. beans, &c. fallow. Theſe common fields were reſpectively divided into *oxgangs*, evenly ſcattered over every field; ſo that each occupier might have an equal or ſimilar ſhare of good and bad, near and diſtant land; the houſes being in this, as in every other common-field townſhip, placed in the *town*. Each field conſiſted of twentytwo oxgangs; each of which, on one ſide of the townſhip, contained twenty four acres---on the other, twelve acres: conſequently the ſix fields contained 2376 acres.

Each diviſion had likewiſe its COMMON MEADOW.

Other portions of the townſhip were laid out in STINTED PASTURES, wholly appendant to the common-field lands; each oxgang of which having a right to a limited number of gaits, for *cows* and *working oxen*.

The

The remainder of the townſhip, containing many thouſand acres, was COMMON.

During this century, the common fields and common meadows have been gradually contracting, by amicable *exchanges* and tranſfers, and are, now, in a manner wholly incloſed. The ſtinted paſtures have, at different times, been incloſed "*by commiſſion*;" namely, by the unanimous reference of the parties concerned, to certain arbitrators or commiſſioners, appointed by themſelves; without calling in the aid of parliament. The commons are now under incloſure, purſuant to a *bill* procured for that purpoſe.

This bill, and the circumſtances attending the procurement of it, afford a ſtriking picture of modern incloſures by act of parliament.

The lands to be appropriated, in this caſe, conſiſted of 3,700 acres of culturable ſoil, valued (by the commiſſion under the incloſure) at 3s. to 50s. an acre rent; and of a ſtill greater quantity of heathy barren land, reaching to the center of the morelands, valued (by the ſame) from below 3s. down to 3d. an acre. The quantity of oxgang or common-field land (as above aſcertained) 2376 acres; and the number of ancient com-

mon-right houſes, or ſites of ſuch houſes, two hundred and ſixty.

To thoſe 2376 acres *, and theſe 260 houſes or ſites, the commons belonged; but in what proportion had not, for ages perhaps, been clearly underſtood. Within memory, it ſeems, an attempt was made to ſtint them; but the regulation laſted only one year. Before and ſince that time, they have been, in the ſtricteſt ſenſe of the word, *unſtinted commons*, for all kinds of commonable ſtock; excepting SHEEP and WORKING OXEN; which laſt were, *by the by-laws of the townſhip*, confined to the ſtinted paſtures, and the upland commons; and the former, to the upland commons only.

It may be taken for granted, that the firſt mover to an incloſure is private intereſt, rather than public ſpirit. In the caſe of Pickering, the LAND OWNERS, in general, were ſatisfied with the open ſtate of the commons. Some of them who had inherited, ---or purchaſed at an advanced price,---lands which lay conveniently to the commons, were, of courſe, adverſe to an incloſure; and the mere HOUSE OWNERS were either apprehenſive of the ſmallneſs of their claim, or their

* Together with the meadow lands.

their voices were too weak to be heard, among thoſe of the land owners.

Under theſe circumſtances, the commons lay open, and would probably have continued in that ſtate, had there been no other intereſt in the townſhip, than that of the owners of its LANDS and HOUSES.

But the *tithe*, of three or four thouſand acres of corn land, was an object of too great magnitude to be overlooked, by the leſſee (for lives under the Dean of York); and, being ſeen, had charms in it too faſcinating to be loſt ſight of.

Actuated thus powerfully, the *leſſee of the tithes* applied to the LAND OWNERS, to join him in an application to parliament, for an incloſure. The land owners refuſed. Their conduct, however, was impolitic and ill judged; and a fair opportunity loſt is not eaſily regained.

The leſſee of the tithes acted under a reſtleſs impulſe; and no matter the inſtruments he made uſe of, ſo they anſwered his purpoſe. He, therefore, applied to the HOUSE OWNERS; who, ſeeing riches within their reach, which till then they had never thought of, grew frantic with expectation.

A law agent, well ſuited to the deſign,

was pitched upon; and other agents, no leſs qualified, gave him their beſt aſſiſtance. An equal diviſion of the commons, among the houſes only, was the prize held out; and a bill, framed for the purpoſe of obtaining it, was ſent up to Parliament.

A faint ill conducted oppoſition was made, by the land owners; but a more powerful intereſt, well applied, having got there before them, their intentions of throwing out the bill were fruſtrated.

Parliament, however, ſeeing probably the iniquity of the bill, without being willing to enter into a minute inveſtigation, or able, at their diſtance, to aſcertain with conveniency ſufficient facts, left a principal matter open to a trial at law; namely, whether the commons ſhould be divided among the houſes, only; or whether one moiety of them ſhould remain with "the lands of the townſhip, which, "upon the firſt of January 1784, belonged "to the owners of antient common-right "meſſuages, cottages or ſites."

In conſequence of this order of Parliament, the queſtion was tried, on a feigned iſſue, at the aſſize for the county, in the ſummer of 1785.

The

The trial was conducted with the same exertions, on the part of the promoters of the bill, and with the same tameness and ill judged confidence, on the part of its opposers, as had been evident in every stage of the business. These circumstances co-operating with the "uncertainty of the law," a verdict was obtained, in favour of the houses.

Thus, by *management*,—without even the shadow of *right* being offered,—the owner of a mere cottage without a garden-place, or of a heap of stones which had long lain as ruins, and who could have no rightful advantage whatever from the commons in their open state, became entitled to an equal share, under the inclosure, with the largest landowner; who, perhaps, previous to the passing of this law, occupied rightfully, some hundred acres.

It is true, many poor families may gain a temporary relief by this *inequitable* transaction; and so far the bill may have operated beneficially. But it must be evident, to those who have a knowledge of the township, and who think impartially on the subject, that they might, with equal propriety, have been relieved out of the inclosed lands, or the per-

ſonal property of the land owners; and it could not be the intention of Parliament, to be inſtrumental in transferring the property of one man to another, without a ſufficient reaſon: we may therefore ſafely conclude, that Parliament, in this caſe, were either impoſed upon, or judged erroneouſly; or that they are in want of ſome

General Principles of Inclosure.

I ſhall not preſume to dictate to Parliament; but as I have beſtowed an unuſual ſhare of attention on this important ſubject, and may not have another opportunity, ſo ſuitable as the preſent, of ſpeaking my ſentiments upon it, I will here throw together the ideas which have ſtruck me, as a groundwork for further argument.

It will be proper, in the outſet, to take a view of the ORIGIN OF COMMONS, and the firſt laying out of townſhips.

Fitzherbert, whoſe opinion in this caſe is valuable, ſpeaking of cuſtomary tenants, in his 13th chapter of Surveying, ſays, "Cuſ-"tomary tenants are thoſe that hold their "lands of their lord, by copy of court-roll, "after the cuſtom of the manor. And there "be many tenants within the ſame manor "that

" that have no copies, and yet hold by like " cuſtom and ſervice, at the will of the lord: " and in mine opinion, it began ſoon after " the Conqueſt. When William Conqueror " had conquered the realm, he rewarded all " thoſe that came with him, in his viage " royal, according to their degree. And to " honourable men he gave lordſhips, ma- " nors, lands, and tenements, with all the in- " habitants, men and women, dwelling in the " ſame, to do with them at their pleaſure." And in his 40th chapter, in which he propoſes to improve by incloſure, he ſays, " It " is undoubted, that to every townſhip, that " ſtandeth in tillage in the plain country, " there be arable lands to plow and ſow, and " leys to tie or tedder horſes and mares " upon, and common paſture to keep and " paſture cattle, beaſts, and ſheep upon; " and alſo meadow ground to get hay upon." In another part of the ſame treatiſe, chapter 4. " Of foreign paſtures that be com- " mon," he ſays, " This is a dark letter to " be underſtood without a better declara- " tion, for it may be underſtood three ways. " In many towns, where cloſes and paſtures " lie in ſeveralty, there is commonly a com- " mon cloſe taken in, out of the commons

" or fields, by the tenants of the town, for " their oxen or kine, or other cattle, in " which close every man is stinted, and set " to a certainty how many beasts he shall " have in the same, and of what manner of " beasts they shall be.——Another manner " of common is most commonly in plain " champion countries, where the cattle go " daily before the herdman, and lyeth near " adjoining to the common fields; and it " may lie in two or three places or more.—— " The third manner of common is the lord's " outwoods, that lie common to his tenants, " as common moors or heaths, the which " were never arable land."

The same, or a similar distribution of lands remain, in every unincloſed townſhip, to this day. Each townſhip is ONE COMMON FARM; laid out into three arable diviſions, for *corn*; a flat of meadow land, for *hay*;—and one or more *paſtures*, for ſtock.

It appears evident from obſervation, in different Diſtricts of the Kingdom, that, in laying out a townſhip which contains a diverſity of ſoil, the drieſt and beſt lands have been laid out as arable fields; the wetteſt, if ſufficiently found, as mowing ground; and the remainder as paſture land, and as a ſource of fuel.

fuel. In ſome townſhips, part of the paſture ground has been ſet apart as a ſtinted paſture, for ſome particular ſpecies of cattle; and, in others, part of the commonfield land has been laid to graſs, for the purpoſe of teddering horſes upon, in the corn years, and feeding ſheep upon, in the fallow year.

In townſhips of a more uniform ſoil, good land, fit for arable, has been ſet out as common paſture; for, in the days when townſhips were laid out, it would have been leſs poſſible to have cultivated and manured the common fields of a townſhip, without a common paſture, than it would now be, when the uſes of clover and vetches are known, to manage a farm entirely under the plow.

It is therefore evident, that common paſtures and common fields are, in their original intention, and ever have been in their uſe, as inſeparable as animal life and food:—it was neceſſary to keep working ſtock, to till the fields, and almoſt as neceſſary to have other live ſtock, to conſume the ſtraw, and to raiſe manure. And it may be ſafely drawn, as an inference, that the *herbage* of the common paſtures of a given townſhip belong, *in their original intention*, to the arable and meadow

lands

lands of that townſhip: for, without them, the former muſt have lain in perpetual fallow, and the hay of the latter have been uſeleſs. Conſequently, *by the original intention*, every *houſe* which occupied *a portion of the arable and meadow land* of the townſhip, had a right to *a like portion* of the *herbage* of the common paſtures; and this without any regard to the time of its being erected; namely, whether before or after the laying out of the townſhip.

But with reſpect to *fuel*, and the *panage*, (when theſe were not reſerved to the lord) the original intention was undoubtedly different; for a certain plot of woodland (for inſtance) was ſet out, in proportion to the number of *houſes* in the townſhip, at the time of ſetting it out. This was a grant of the lord, *to the houſes in being, at the time of the grant*; which particular houſes thereby obtained an excluſive right to the fuel and panage thus granted; otherwiſe an unlimited and exceſſive increaſe of houſes might have abridged the original habitations in their right, and have done away the original intention.

Since the improvements in navigation, and in the art of mining, have taken place, many common woodlands have, probably, been cleared

cleared away; for it is evident, from obſervation, confirmed by tradition, that many of the graſsland commons, which now remain, and which, a few years ſince, were thickly ſcattered over the kingdom, were formerly covered wholly, or partially, with wood; the original ſources of fuel and panage: which *fuel and panage* belonged excluſively to the *original houſes:* conſequently, when the land which produced them was cleared, theſe *houſes* had a plea for an excluſive right to the *herbage* which ſucceeded.

Thus the *ancient houſes* having, by original right, a claim upon the *wood*, and, by implication, upon the *herbage* which ſucceeded it, they became objects of importance, compared with modern houſes; and it appears to have grown gradually into a cuſtom, which in time became law, that no modern houſe, nor even the lands of the townſhip which lay to them, ſhould enjoy either the fuel *or* the herbage of the commons.

And thus the antient houſes, by implication, gained in part, and, by uſurpation, entirely, a privilege of *preſenting* the lands of the townſhip, with the *freedom* of the commons: which privilege has rendered them more valuable, than modern houſes, of equal ſize; and this dif-

difference in value is the real intereſt they have in the commons.

It is the moſt they ever had, or can of right have, while the commons remain open. For a mere houſe, without land, has neither plow to work, manure to raiſe, nor fodder to conſume, and cannot, in the ordinary courſe of huſbandry, make any uſe whatever of the *herbage* of a common.

And with reſpect to the privilege of preſentation, it is equally vague, in the owner of an antient houſe, to lay claim to an equalized ſhare of the lands of a common, becauſe he has a power of enfranchiſing the lands of others, as it would be in a lay-preſenter of a living, to lay claim to the benefice, becauſe he has the advowſon. Whatever the *advowſon* is worth, ſo much intereſt the preſenter of the herbage of a common, or the profits of a living, has in that common, or that living.

From theſe premiſes we may infer, that *now*, neither an antient houſe without lands, of a given townſhip, belonging to it, nor a parcel of land without an antient houſe being held with it, is entitled to any ſhare of the common herbage of that townſhip. But, when-

whenever this houſe regains land, or the land is again laid to an antient houſe, the right of commonage returns. The right, therefore, only lies *dormant*; and is not, in either caſe, *extinguiſhed*.

The ſame of a ſite. While covered with ruins, it can have no right either to fuel or herbage; but whenever the houſe is rebuilt and inhabited, a right of fuel returns; and having had lands laid to it, a right of herbage. And whatever a ſite is worth over and above the value of the land it contains, ſo much intereſt it has in the common lands of the townſhip it lies in.

The intereſt of *dormant lands* may be aſcertained, in a ſimilar way: whatever their value is depreciated by the alienation from the commons, ſo much *leſs* intereſt they have in a diviſion of them. To ſhut them out of an Incloſure Bill is to take them by ſurprize, and thruſt them out of the townſhip; thereby ſtrangling that right which before had only ſlept; and which might the next year, or the next day, have awakened in its fulleſt luſtre.

Beſide theſe particular intereſts, there is one general intereſt to be conſidered; namely, the *ſituation* of lands, houſes, and ſites, with reſpect to the common to be incloſed;—for

houſes,

houſes, at leaſt, which are ſituated contiguous to a common, had, in the firſt inſtance, have had, ever ſince, and muſt have, while the commons remain open, a greater benefit from its herbage, and have on that account been ſold and purchaſed at a greater price, than houſes ſituated at a diſtance; and, of courſe, have a right to a greater ſhare of the lands to be incloſed.

The intereſts of *ſites* vary in a ſimilar manner.

But, with reſpect to *lands*, this ſpecies of intereſt is leſs evident. While common fields and common meadows lie open, they have little advantage or diſadvantage from ſituation, with reſpect to the common paſture. But where the arable and meadow lands have been incloſed, and the paſtures remain open, ſituation becomes of conſiderable importance. And where the appropriated lands have been long held in ſeveralty, and have been ſold and purchaſed under thoſe circumſtances, the lands which lie near to the common paſtures ſeem to have gained, by the circumſtance of incloſure, ratified by long uſage, an extraordinary and *permanent* intereſt in the herbage; an intereſt which they can never loſe, ſo long as the appropriated lands remain incloſed, and the

the common paſtures remain open. Hence, it is unwiſe in thoſe, whoſe lands lie at a diſtance from the common paſture, to ſuffer a partial incloſure to take place; for by that means they are eſtabliſhing, to their own diſadvantage, a ſpecies of intereſt in common paſtures, which before had no exiſtence.

Before we proceed farther, it may be proper to conſider the *limits of commonright*, on *unſtinted* common paſtures.

It is generally underſtood, and may, I believe, be conſidered as the common law of the realm, that each commonright houſe has a power to ſummer as much ſtock on the common, as the lands which lie to it will winter: or, to ſpeak more practically, a right to ſtock in proportion to the value of the lands, reſpectively held with the commonright houſes: for it ſo happens, that by improvements in huſbandry, ſince the time of laying out townſhips,—more eſpecially where the appropriated lands have been incloſed,—commons in general are unable to ſupport, in ſummer, ſo much ſtock as the arable and meadow land can, in winter; conſequently, it is become impracticable to adhere, ſtrictly, to the antient regulation: which antient regulation, however,

ever, though time has rendered it in moſt caſes impracticable, is as ſtrong an evidence, as is neceſſary to be produced, in favor of the herbage of unſtinted commons belonging ſolely to the land.

That the idea is antient, and not of modern invention, may be ſeen in Fitzherbert; who, in his 6th chapter, "Of Foreign Woods, "where other men have common, but where "the lord may improve himſelf," ſays; "It is clearly ordained by the ſtatute of "Merton, and after confirmed by the ſta- "tute of Weſtminſter, that the lord ſhall "improve himſelf of his waſtes—leaving his "tenants *ſufficient* common. It is neceſſary to "be known what is *ſufficient common*; and that "to me ſeemeth by reaſon ſhould be thus: "To ſee how much cattle the hay and the "ſtraw, a huſband getteth upon his own te- "nement, will find ſufficiently in winter, if "they lie in the houſe and be kept therewith "all the winter ſeaſon; for ſo much cattle "ſhould he have common in ſummer; and "that is *ſufficient common*. It conſequently follows, that the occupier of a houſe without land could not, of right, keep cattle upon the common in ſummer; becauſe his tenement afforded

afforded him neither hay nor ſtraw, wherewith to keep them in the houſe, during the winter ſeaſon.

Laſtly, the intereſt of the *lord of the ſoil* requires conſideration. Here, Fitzherbert's treatiſe may be taken as a ſafe guide. The groundwork, of the firſt ſeventeen chapters, is a ſtatute of Edward I. named *Extenta Manerii*; of which Fitzherbert himſelf gives the following account: "In mine opinion, this "ſtatute was made ſoon after the Barons' "wars, the which ended at the battle of "Eveſham, or ſoon after, in the time of "king Henry III. whereat many Noblemen "were ſlain, and many fled, who after were "attainted for the treaſon they did to the "king. And by reaſon thereof their caſtles "and manors were ſeized into the king's "hands. And ſo for want of reparation the "caſtles and manors fell to ruin and in decay. "And when the King and his Council ſaw that, "they thought it was better to extend them, "and make the moſt profit that they could of "them, than let them fall to the ground and "come to no man's help and profit; therefore, "King Edward I. ordained this ſtatute to be "made the fourth year of his reign, wherein "is contained many and divers chapters and

" articles, the which, at that time, were but " inſtructions how and what they ſhould do " that were Commiſſioners or Surveyors in " the ſame."

Inſtructions, framed by Parliament, and explained by an able Judge, afford evidence of the higheſt authority.

A clauſe of the ſtatute, reſpecting common paſtures, runs thus: " It is to be enquired of " foreign paſtures that be common how many " and what ſort of cattle the lord may have " in the ſame, and what the paſture of a beaſt " is worth by the year."

It is this clauſe which Fitzherbert ſays is " a dark letter to be underſtood without a bet- " ter declaration;" becauſe there are three ſorts of commons: namely, a ſtinted common cloſe;—a tended common, open to the common field;—and the lord's outwoods, or unſtinted common paſture. In the two former, he ſays, " the lord ſhould be put to a cer- " tainty—and every man be ſtinted either by " yard-lands, oxgangs, rents, or ſuch other " cuſtom as the tenants uſe,—and the lord in " like manner."—But in the outwoods, " me " ſeemeth the lord ſhould not be ſtinted nor ſet " to a certainty, but put his cattle upon ſuch " manner of common paſture at his pleaſure; " becauſe

" becauſe the whole common is his own, and " his tenants have no certain parcel thereof " laid to their holdings; but all only *bite of* " *mouth* with their cattle:" by which is evidently meant (from various paſſages) *ſufficient bite* for the tenants' cattle. Hence, it clearly follows, that if the herbage of the common be *more than ſufficient* for the cattle of the townſhip, the overplus, be it more or leſs, belongs to the lord. On the contrary, if the herbage of the common is *not more than ſufficient* to ſummer the cattle, which the townſhip can maintain in winter (in an unincloſed ſtate), the lord has not (*merely as ſuch*) any intereſt whatever, in the *herbage* of the commons within his manor.

In another clauſe, reſpecting outwoods ſpecially,—the ſtatute orders, that it " be en- " quired of foreign woods, where other men " have come-in, what part of thoſe woods the " lord may improve himſelf of, and of how " many acres, and for how much the *veſture*, " that is to ſay, the *wood* of every acre may " be ſold, and how much the ground is worth " after the wood be fallen, and how many " acres it contains, and what every acre is " worth by the year."

By this clauſe, it is implied by Parliament,

that the *wood* of a common belongs ſolely to the lord: and Fitzherbert's expoſition of it implies the ſame idea: "The declaration of "this ſtatute is doubtful; becauſe of the "non-certainty of what is *ſufficient common*;" —which having explained as above, he continues, "You ſhall underſtand that there be "four manner of commons, that is to wit;— "common appendant,—common appurte- "nant,—common in groſs,—and common "becauſe of neighbourſhip. Common ap- "pendant is where the lord of old time hath "granted to a man a meſeplace and certain "lands, meadows, and paſtures, with their "appurtenances, to hold of him. To this "meſeplace, lands, and meadows, belongeth "common, and that is common appendant. "—Common appurtenant is where a man "hath had common to a certain number of "beaſts, or without number, belonging to "his meſeplace in the lord's waſte: this is "common appurtenant by preſcription, be- "cauſe of the uſe out of time of mind.— "Common in groſs is where a lord hath "granted, by his deed, common of paſture "to a ſtranger that holdeth no land of him, "nor ought to have any common but by "reaſon of that grant by deed.—Common

"of

" of vicinity or neighbourſhip is where the " waſte grounds of two townſhips lie toge- " ther, and neither hedge nor pale between " to keep their cattle aſunder: this is com- " mon becauſe of neighbourſhip; and it is " not uſed nor lawful to pin the cattle ſo " going; but in good manner to drive and " chace beſide ſuch common."

Of common in groſs, he ſays, " the lord " may not improve himſelf of any parcel; for " it is contrary to grant, though there be ſuf- " ficient of common." But " ye ſhall un- " derſtand that how be it a lord may not im- " prove himſelf of his waſte grounds, yet may " he lawfully fall and ſell all the wood, " broom, gorſe, furze, braken, fern, buſhes, " thorns, and ſuch other, as free-ſtone, lime- " ſtone, chalk, turves, clay, ſand, lead-ore, " or tin, to his own uſe; for the tenant may " have nothing by reaſon of common, but " only bite of mouth with his cattle."

Hence, we may conclude, that the cutting of *fuel* (if practiſed) was, *then*, merely on ſufferance.

In his explanation of a clauſe reſpecting *panage*, &c. he ſays, " Where this ſtatute " ſpeaketh *de panagio*, that is to be underſtood " where there is any maſt growing in the

" lord's wood, whereby men's ſwine may be " fed and relieved; what profit that may be " to the lord; for there is no man that can " claim of right to have the maſt, the which " is a fruit, but the lord; and the lord ſhall " have it in foreign or outwoods, as well as " in his parks or ſeveral woods; and as the " quantity of maſt is, ſo the lord's bailey " ought of right to lay men's ſwine there- " unto from Michaelmas to Martinmas, and " to make a true account thereof at the lord's " audit, what he taketh for every ſwine."

Thus it appears, that not only *fuel*, but *panage*, likewiſe, was originally a matter of ſufferance, when enjoyed by the tenants.

From theſe premiſes, and from the preſent *inſufficiency* of commons, we may ſafely infer that the lord (merely as ſuch) has no intereſt whatever in the *herbage* of commons within his manor. But we may infer, with equal ſafety, that of the *wood* of a common the lord is ſole proprietor; *except* where a right of fuel and panage has been eſtabliſhed by long cuſtom; for, in this caſe, preſcription has fruſtrated the original intention; and, here, the *houſes* have a joint intereſt with the lord.

Laſtly,

Laſtly, with reſpect to *heaths* and *peat-moors*, from which the inhabitants of a town-ſhip have, by preſcription, a right of cutting fuel:

The ſtatute orders, that it be enquired of moors, heaths, and waſtes, what they be worth by the year:—and Fitzherbert ſays, "Moors, heaths, and waſtes, go in like man-"ner as the herbage of the town; for the "lord's tenants have common in all ſuch "out grounds with their cattle; but they "ſhall have no wood, thorns, turves, gorſe, "fern, and ſuch other, *but by cuſtom*, or elſe "ſpecial words in the charter."

We may therefore conclude, that the lord has no intereſt in the *herbage* of a heath; nor in the *fuel*; except there be *more than ſufficient* for the uſe of the inhabitants of the ancient houſes; in which caſe the lord ſeems to have an intereſt in the overplus; *provided* he can reap the benefit of it, without injuring the *herbage*.

From the ſum of this evidence it appears, that, at this day, lords of manors, in general, have no other intereſt in the commons, within their reſpective manors, than in the *mines*, the *quarries*, and the *wood*. The *herbage* be-

longs to the land; and the *fuel* (where cuſtom allows it to be taken) to the houſes.

As to the *right of ſoil*, it appears to be merely *honorary*: for the ſoil cannot be removed, nor turned to advantage, without deſtroying or injuring the *herbage*. A lord of a manor has, however, a *claim* upon the *ſoil*, though indirect: for no man, nor ſet of men, can break it without his conſent. But this ſeems to be a claim of *honor* rather than of *intereſt*; for, while the commons remain open, he cannot, in ſtrict legality, reap any *emolument* from it.

Thus we have enumerated five diſtinct intereſts.

1. COMMONRIGHT LANDS* HELD WITH COMMONRIGHT HOUSES. To theſe lands *the*

* By COMMONRIGHT land is meant the original common field and common meadow land, and ſuch other land, lying within the townſhip, as has, by grant or preſcription, a right of commonage when held with a commonright houſe; in contradiſtinction to ſuch lands of the townſhip as have not, and to the lands of the reſt of the kingdom which never can have, by any legal act, ſuch a right, though held with a commonright houſe. Suppoſe nine tenths of the townſhip in a ſtate of temporary alienation, by ſome legal circumſtance which could not be avoided, or by any circumſtance whatever, could the other tenth part catch the opportunity

the benefit of the herbage belongs, in proportion to their value; and the right of the reſpective parcels, to ſhare in a diviſion of the *lands*, ought to be aſcertained by their intrinſic quality, and their affinity to the common (where this operates on their value in the open ſtate) taken jointly *.

2. COMMONRIGHT LANDS HELD WITHOUT COMMONRIGHT HOUSES. The original right of theſe lands was indiſputably the ſame

tunity in the interval of ſuſpence, and appropriate the lands of the commons to this one tenth of the townſhip? It would be abſurd to ſuppoſe it. If one tenth cannot by any advantage chouſe the other nine, why ſhould nine parts of a townſhip be ſuffered to ſhare the right of the tenth? See p. 52.

* To ſet aſide the lands of the townſhip entirely (as in the caſe of Pickering) is too abſurd to be treated of ſeriouſly. Suppoſe nine acres of ten, or ninety-nine of one hundred, of a given townſhip, to belong to one houſe, and the other one-hundredth part to be divided among two hundred and fiftynine houſes: or ſuppoſe the commons of a given townſhip to contain many thouſand acres, and the appropriated commonright lands to conſiſt of 2376 acres; that the commonright houſes of the townſhip were only two, and that 2370 acres of the appropriated lands belonged to one houſe, the other ſix acres to the other houſe; would it be equitable in either caſe to divide by the houſes? If not in theſe caſes, why in any caſe where the principle of right is preciſely the ſame?

ſame as that of the other lands of the townſhip; and their *temporary alienation* is merely a circumſtance, which does not extinguiſh, but only ſuſpends, their right to a *benefit of the herbage.* Whatever this temporary alienation depreciates them, below the other lands of the townſhip of the ſame intrinſic quality, in ſimilar ſituations, ſo much proportionably leſs is their right to a ſhare of the *lands* of the common *.

3. COMMONRIGHT HOUSES. The proportional rights of houſes depends on the nature of the commons to be incloſed.

If they produce *herbage alone*,—a commonright houſe ought to ſhare with the lands, in proportion to its *extra value* as ſuch; that is to ſay, whatever it is worth more than a non-commonright houſe of the ſame *intrinſic* value, in a ſimilar ſituation, ſo much it ought to be eſtimated at, in the general valuation

* The depreciation here intimated will ſeldom take place; for the appropriated lands of a townſhip are worth *more* to the occupier of a commonright houſe; becauſe they intitle him to a greater ſhare of the common paſturage, than to the occupier of a non-commonright houſe, to whom they can ſeldom give any adequate privilege.

luation of the commonable property of the townſhip *.

If the common to be incloſed produce *fuel alone*, the houſes (or the houſes and the lord of the ſoil, if an overplus can be proved) are alone intitled to it.

If *herbage and fuel jointly*, the lands and houſes have rights in it, proportioned to the herbage and the fuel it produces †.

4. COMMONRIGHT SITES. The right of ſites is ſimilar with that of houſes: whatever the dormant right of preſentation and the dormant right of fuel are worth, ſo much in proportion they ought to ſhare with the lands and houſes.

5. The

* The *extra value* of commonright houſes varies with the value of the commons and the number of houſes. Thus, ſuppoſe the commons of two diſtinct townſhips to be of equal value, and that one townſhip contained ten, the other one hundred commonright houſes; the right of preſentation would be worth more in *that* than in *this* townſhip: and where herbage alone is the produce of the common, the right of repreſentation and the extra value are the ſame.

† If part of the commons to be incloſed produce herbage alone, and other parts principally fuel, and a ſeparate diviſion be made (as in the caſe of Pickering), the *extra value* is compounded of the right of preſentation to the herbage, and the right of cutting fuel; either of which being eſtimated, the other is of courſe ſufficiently aſcertained.

5. THE LORD OF THE SOIL. To the lands of a common, on which *open woodlands* ſtill prevail, the lord of the ſoil has a principal right. But whatever the *bite of mouth* is worth, ſo much in proportion the *land* is entitled to; and if a right of *fuel* be eſtabliſhed by cuſtom, the *houſes* have their claim. Whatever proportional advantage the ſeveral intereſts would receive, in an open ſtate, ſuch proportions of the land they are ſeverally intitled to, under an incloſure.

If *valuable mines* and *quarries* be given up, the lord ought to receive an equivalent, in *land*, and is entitled to ſome ſhare, for the mere *chance* of mines, and quarries, being hereafter diſcovered. But of *naked commons*, affording neither wood nor fuel, and of which the mines and quarries are reſerved, the lord of the manor (merely as ſuch) has not, on the principles offered, any right to ſhare in a diviſion of the ſoil, ſaving the honorary right which has been already mentioned *.

While

* In the caſe of Pickering, the Crown, as owner of the "honor, foreſts, and manor of Pickering" (in right of the dutchy of Lancaſter), had *one tenth* of the principal part of the townſhip, and *one fifteenth* of the remaining part, granted by the act of Incloſure.

The

While the PICKERING BILL is before me, I will make a few further remarks.

1. *Five commiſſioners appointed:* three of them, only, being directed to value the common lands, and to ſet out the king's allotments. Of theſe three, one was nominated by the chancellor of the dutchy of Lancaſter; one by the leſſee of the tithes (who could have no ſpecial right of nomination, as no part of the commons was ordered by the act to be ſet out as tithes); and the third by the proprietors of the townſhip. Before the lands were valued, and the allotments ſet out, the commiſſioner of the tithe-leſſee obtained an appointment under the Crown; in con-

The woodlands, in this caſe, had formerly been incloſed and held by the Crown in ſeveralty; and the remainder of the commons given up entirely to the appropriated lands of the townſhip; ſhutting out even the park, and ſome demeſne land of the dutchy, from a right of commonage; ſo that neither *wood* nor *woodland* is by the act given up: yet *all the manerial rights* are reſerved; except the *honorary right of ſoil*, and except *quarries of ſtone and ſlate:* which laſt are ſufficiently abundant in the old appropriated lands to ſupply the townſhip with building materials and lime manure for at leaſt a thouſand years. Therefore, the conſideration given up was of inconſiderable value—compared with that which was given as *equivalent*; but which appears to be, *in this particular caſe*, unreaſonable and exceſſive.

conſequence of which the townſhip was in effect valued, and the Crown allotments ſet out, by the agents of the Crown, without the proprietors of the townſhip having, in any caſe, a caſting vote; their commiſſioner becoming, under theſe circumſtances, a mere by-ſtander.

It would be well if, in caſes of importance, *honorary commiſſioners*, choſen out of the independent gentlemen of the neighbourhood, could be appointed; as a check upon acting commiſſioners, in predicaments of this nature.

2. New *roads* to be made, and old ones to be repaired; — common drains to be opened, and *public reſervoirs* formed, by the commiſſioners, at the joint expence of the lands to be incloſed.

The forming of reſervoirs of the waters collected by the roads, for the purpoſe of public drinking pools, ought to be a ſtanding clauſe in every Incloſure bill; and commiſſioners, moſt eſpecially in upland ſituations away from running waters, ought to pay due attention to it.

3. Lands, exceeding the yearly value of three ſhillings an acre, to be divided and *incloſed*, — the reſidue to be *allotted, only*; leaving

leaving it in the option of the perſons to whom they be allotted, to incloſe them, or let them remain in a ſtate of open common; ſubject to ſuch regulations as the commiſſioners ſhall appoint.

Too much cannot be ſaid in praiſe of this diſtinction. Good land will always pay for incloſing, and be the moſt valuable in that ſtate; but bad land is frequently too dear at that price: many men of comfortable fortunes have, in this Diſtrict, been beggared, and the fortunes of others injured, by the incloſing of lands which have not yet paid, nor probably ever will repay, the expence; and the ſame may be obſerved, in other Diſtricts of the kingdom.

4. A good regulation reſpecting *fences* is likewiſe noticeable. The act allows a privilege of placing a fence, on the outſide of the ditch, upon the adjoining allotment, to defend the face of the young hedge; and to remake and remove ſuch fence during and within the ſpace of ten years. Alſo to continue the fence at the ends (by rails reaching over the croſs ditches (to the poſts or rails of the adjoining croſs fences.

5. Laſtly, the reference of matters in diſ-

pute

pute to a *trial at law* requires the moſt mature conſideration.

The appropriation of commonable lands is an important matter: they are uſeful, in an open ſtate; but would, in general, be much more uſeful, in a ſtate of Incloſure. Whoever has reaped a rightful benefit from them, time immemorial, ought to have that benefit continued to them: and all that Parliament has to do is, to aſcertain the quantity of right, of each party or intereſt concerned, in the particular bill before them;—*or* to refer ſpecial matters, in diſpute, to ſome other inqueſt, more peculiarly adapted to the neceſſary enquiries;—*or* to refuſe the application.

A court of aſſize is, perhaps, the moſt improper inqueſt, which could be referred to, for ſettling diſputes reſpecting Incloſures: and are, certainly, much leſs adapted to make the neceſſary enquiries, than a committee of the Houſe of Commons; where every Member is a *judge*, and has ſufficient time for deliberation; whereas, in a court of aſſize, all is hurry and tumult; with only *one* man to think, and the mind of this one man neceſſarily crowded, with a chaos of ideas.

It

It will however be ſaid, that a ſpecial jury, of the county in which the ſite of Incloſure lies, are the fitteſt to determine the rights of the claimants. This, in theory, is plauſible; but is ſeldom verified in practice.

In the caſe of Pickering, only four of the ſpecial jury attended; and one of theſe was a tradeſman of the city of York. It is highly probable, that not one of the jury reſided within twenty miles of the ſite of Incloſure; or had the ſmalleſt ſhare of perſonal knowledge, either of the ſite, or the ſubject of Incloſure. A jury impanelled, in any other county of the kingdom, might have been equally qualified for the purpoſe.

It was therefore a *mere trial at law*, which, to a proverb, is a game at hazard. The houſes were, once, within a point of loſing the game: Sir Thomas Davenport died, and Mr. B. (their two leading counſel) was put under arreſt, the day before the trial was to have come on; and their agents, ſanguine as they had heretofore been, now, on thoſe *accidents* happening, gave themſelves up to deſpair. But, by *chance*, or by *management*, the trial was poſtponed. The houſes, now, came into court, fully prepared, while the land, by a train of *ill luck* or *bad management*,

was, in effect, left without an advocate; and, solely by "the uncertainty of the law," lost its right. Even the house owners, themselves, considered the verdict as a game artfully won — and their *large* allotments, as plunder bravely got. Right was out of the question: the idea of it had been absorbed, long before the decision, in rancour and ill blood; a circumstance more to be lamented, than the inequitable division of the commons.

In the case of KNARESBOROUGH, too, a dispute, between the land owners and house owners, was ordered to be decided by *legal conteſt*. There, as at Pickering, the houſes * claimed the whole; but the lands *happening*, in that case, to employ the better forces, they gained the day. Almost the whole forest was divided among the land owners: even a meſſuage

* In this case the houſes were divided into *meſſuages* and *cottages*—one meſſuage was considered as equal to two cottages. This distinction, which is not uncommon, has most probably arisen from the circumstance of the woodlands being grubbed for the sake of herbage. A meſſuage, namely, a house with which land was anciently occupied, had not only a privilege of cutting *fuel* in the outwoods, but, of neceſſity in early days, a privilege of taking *plowboot*, *cartboot*, &c. Hence, its claim upon the *herbage* which ſucceeded the *wood* became greater than that of a mere cottage, with which no lands being occupied, had no uſe for implements of husbandry.

meſſuage did not ſhare, on the beſt land, more than two acres. The land owners had offered the houſe owners a greater proportion; but they choſe to take their chance in a court, as other deſperadoes take their chance in a lottery—a landed eſtate, or nothing; and, it is ſaid, what ſome of them got did not pay their extra expences. Here, the *poor* man loſt his right: a circumſtance which renders the caſe of Knareſborough *harder* than that of Pickering.

Theſe are facts which appear to be ſufficiently ſtriking, to induce Parliament to eſtabliſh ſome GENERAL PRINCIPLES OF INCLOSURE, and to enquire, themſelves, into the rights of claimants: or, if a committee of Parliament cannot conveniently determine, to order reference to a commiſſion of independent diſintereſted men, in the immediate neighbourhood of the ſite of Incloſure; who, having perſonal knowledge of the premiſes, and the claiming parties, are beſt enabled to judge of their reſpective rights: or, if the oppoſition in Parliament be ſtrong, and the matters in diſpute too weighty to be left to reference, to ſend back the petitioners, and let the commons remain open. It does not

follow, that becauſe a few individuals, inſtigated, perhaps, by one more intereſted than the reſt, take it into their heads to try their fortune in a Bill of Incloſure, that a ſuite of valuable commons ſhould of neceſſity be incloſed. A few years might reconcile differences in opinion; and, then, there might be no difficulty in aſſigning every man his rightful ſhare.

The fate of SINNINGTON was determined by that of Pickering; the different intereſts having agreed, previouſly to the trial, to abide by the deciſion of the court.

The Sinnington bill is entitled to a few remarks:

1. *Tithe.* It is difficult to write with temper on the ſubject of tithes. At the time they were inſtituted, ſpecie was little in uſe, as a medium, between the producer and the conſumer of the productions of the ſoil; and then it might be neceſſary, that the clergy ſhould be ſupported out of its immediate produce. But to continue this ancient regulation, in a time when money is become the univerſal medium of property, and when improvements in cultivation engage the attention of all ranks of mankind, is an impropriety,

propriety, which none but the abettors of oppreſſion will defend.

A general diſſolution of tithes, though fervently to be deſired, is not probably yet near at hand: the bugbear *innovation* is, at preſent, too terrible in the eyes of the Many: but, under the circumſtances of the preſent times, to *increaſe* the quantity of titheable lands, as in the caſe of appropriating commons without aſſigning ſome certain part of them, *or ſome other equivalent*, in lieu of tithes, is a *crime* which poſterity will never forgive.

In the caſe of Sinnington, every thing is done which, under the falſe principles of the bill, could be done: indeed more; for even the general principle of the bill was broken into, with reſpect to the tithes. The act aſſigns *one tenth* of the commons *for the tithe of the commons*; and, afterwards, empowers the commiſſioners to ſet out a further parcel of them, for *half* the tithes of the old-incloſed lands of the townſhip, belonging to the commonright houſes: which is, in effect, giving ſo much of the commons to the commonright *lands*, independent of the *houſes*. And further authoriſes the commiſſioners to award a perpetual modus or

money-payment, in lieu of *the other half* of the *commonright lands*; and for the *whole* of the *dormant lands*; namely, ſuch lands as had not, ſome time previous to the paſſing of the bill, a commonright houſe *belonging* to them *. Thus the entire townſhip is freed, for ever, from a ſpecies of oppreſſion, which the whole kingdom is entitled to be relieved from.

2. *Lord of the ſoil.* The Sinnington Bill aſſigns one *five-and-twentieth* for the *right of ſoil* only; all other manerial rights whatever being reſerved. No *quarries*, or known beds of *marl*, &c. on theſe commons.

3. *Denizen right.* The priory of Keldholm, which anciently ſtood at a ſhort diſtance from theſe commons, without the boundaries of the townſhip of Sinnington, had a right or freedom of commonage, for ſixty beaſts, and four hundred ſheep. This right has, of late years, and perhaps ever ſince the

* The falſe ground of this diſtinction has been already ſhewn. Suppoſe a transfer of a principal part of theſe lands to have taken place (through ordinary circumſtances, without any ſiniſter views to an Incloſure) about the time the excluſion of right takes place,—would the mere *circumſtance* of fixing the particular day of excluſion twenty-four hours before or twenty-four hours after the day of transfer, alter, either one way or the other, the *natural right* of ſuch lands to ſhare in the benefits of the Incloſure!

the diſſolution of the priory, been exerciſed in part, but never perhaps wholly. The Earl of Scarborough, who is at preſent in poſſeſſion of this right, has received little more than a yearly acknowledgment: nevertheleſs, on a diviſion of the commons, his claim became important; for the ancient right, in its fulleſt extent, was equal, perhaps, to half the paſturage of the commons under incloſure.

In this caſe, the dictates of common prudence would have led the promoters of the bill to have fixed the quantity of right, before they went to Parliament. This, however, was neglected, and all the act empowers the commiſſioners to do, in this reſpect, is, to examine into the merits of the claim, and ſet out ſuch a part of the commons, as appears to them to be a compenſation. The conſequence is, an injunction has been granted to ſtop proceedings: through which circumſtance the incloſure is at a ſtand, to the great inconveniency of the townſhip. A certain and conſiderable expence is incurred—commonable ſtock ſold off—and fencing materials prepared—without, at preſent, any certain advantage accruing; a predicament this, which ought to caution the promoters of Bills of Inclo-

ſure, to have a clear underſtanding with the ſeveral intereſts concerned, before they burden the townſhip with the expences of a bill, and the conſequent inconveniencies.

4. *Alien claim.* Another claim is made upon theſe commons—by the owner of a farm which lies by the ſide of them, and whoſe ſtock has, time immemorial, been ſuffered to depaſture upon them. It is ſuppoſed that this encroachment has been made thro' the means of a *windrake* * acroſs a corner of theſe commons, to a river which runs at a diſtance; or that it has been ſuffered to take place, through mere neglect: let this be as it may, it ought to be a leſſon to unincloſed townſhips, to attend to the ſtock of their reſpective commons. I term it an incroachment, becauſe there is not a more general poſition, than that the commons of a given townſhip belong, in original right, to the lands and houſes of that townſhip, and that no right of commonage can be juſtly claimed, by the lands and houſes of another townſhip, unleſs a ſpecial grant, or ſomething adequate to it, can be produced. Cuſtom may, in this caſe, be conſidered, in law, as adequate to a grant;—although,

* See ESTATES AND TENURES.

although, in equity and common ſenſe, it might ſeem more reaſonable to award damages, for a treſpaſs, than a portion of the commons, as a compenſation.

5. *Fencing.* The whole to be incloſed, within ſix months from the time of ſtaking out. Counter fences may be made upon the adjoining allotment, and over the terminating croſs ditches *. Sheep to be kept out of the new incloſures, during the firſt ſeven years; and all kinds of ſtock out of the lanes, during ten years;—after which time, the ſurveyors of the *roads* of the townſhip may let the graſs of the lanes and byeways, and apply the rents to the repair of the roads:—an admirable clauſe!

6. *Appeal.* By this bill, perſons aggrieved may appeal to the Quarter-Seſſions; except in ſuch caſes where the determinations of the commiſſioners are directed to be final. This, *in ſome caſes*, may be a check upon the acting commiſſioners; but is far from being equivalent to a ſpecial commiſſion of gentlemen, reſident in the neighbourhood, who would, *in all caſes*, be on the ſpot, to be appealed to. To do ſtrict juſtice to every individual, in a complicated buſineſs of this nature,

* See Page 79.

ture, is beyond the power of abilities and honeſty to accompliſh; but the nearer this ſummit can be approached, the better; and every probable means ſhould be employed in attempting it.

In the caſe of MIDDLETON, *half* the commons were aſſigned to the HOUSES, *half* to the LAND, in proportion to the *land tax:* a mode of diviſion which has, I believe, been pretty generally adopted in the Vale.

This method of apportioning the ſhares of the land owners is, in townſhips where the land tax is levied by rack rents, more equitable, than it is in caſes where it is paid by ancient valuation, as it was in Middleton when the Incloſure took place: but it cannot, in either caſe, be ſtrictly equitable; nor approach ſo near to ſtrict equity, as a valuation according to circumſtances, at the time of incloſure.

On *this*, alone, an equitable diviſion of commonable lands can be made: not with reſpect to land, only; but with regard to every other ſpecies of commonable property. WHATEVER BENEFIT THE SEVERAL INTERESTS, AND THE INDIVIDUALS OF THE RESPECTIVE INTERESTS, RIGHTFULLY ENJOYED, PREVIOUSLY TO THE INCLOSURE,

SURE, OR WERE, *in reverſion*, RIGHTFULLY ENTITLED TO, (AS DORMANT LANDS AND HOUSES), SUCH PROPORTIONAL BENEFIT THEY ARE SEVERALLY ENTITLED TO, UNDER AN EQUITABLE APPROPRIATION.

BEFORE I take leave of this ſubject, I will note the effects of the three different means of Incloſure, which have been, in different townſhips, made uſe of, in this Diſtrict: namely,

1. Incloſure by Exchanges, &c.
2. Incloſure by private commiſſion.
3. Incloſure by Act of Parliament.

1. INCLOSURE BY EXCHANGES. In the northweſt diviſion of the Vale, the common fields and common meadows have moſtly been incloſed, progreſſively, piece after piece; either in the original ſlips, ſingly; or more than one of them have been joined by purchaſe, or by private exchanges between the ſeveral proprietors: by which means the whole of the appropriated lands of the townſhips, in which this ſpecies of Incloſure has taken place, have been, in proceſs of time, incloſed and held in ſeveralty.

This method of Incloſure is attended with at leaſt one diſagreeable conſequence. The

common-

common-field lands having lain principally in ſingle ridges, ſome of them, perhaps, near a mile in length, the Incloſures are badly proportioned. They are either too long for their width, many of them reſembling lanes rather than fields; or, if cut into lengths, there are no driftways to the inner diviſions: —beſides, much unneceſſary fencing, with all its attendant evils, is by this mode of Incloſure incurred; and what is yet worſe, each man's property is ſtill, perhaps, ſcattered over the townſhip.

2. INCLOSURE BY PRIVATE COMMISSION. Some entire townſhips (except perhaps the unſtinted commons), and many ſtinted paſtures, have been laid out by commiſſioners, choſen unanimouſly by the ſeveral intereſts concerned, without ſoliciting the aſſiſtance of Parliament.

By this means, the diſtinct properties are laid together, in well ſized and well proportioned Incloſures, with proper roads and driftways; and this without the expence, the inconveniency, or the *uncertainty* attending an application to Parliament.

3. INCLOSURE BY ACT OF PARLIAMENT. By this expedient, the advantages abovementioned are obtained in their fulleſt extent;

extent; but they are unavoidably burdened with a train of attendant evils, which render this mode of Incloſure much leſs eligible, than that of incloſing by *general conſent*.

This, however, is frequently impracticable: obſtinacy has its adherents, in every townſhip; and where various intereſts are concerned, as in the caſe of dividing unſtinted commons, it is ſcarcely poſſible that every intereſt, and every individual of each intereſt ſhould be of one mind. Therefore, without *ſome* exertion of legal authority, unſtinted commons, in general, muſt continue to lie open.

But it does not follow that, becauſe ſome is neceſſary, much ſhould be uſed. It may be received as a ſound poſition, that in caſes where an Incloſure would be highly beneficial to a townſhip at large, a great majority of the individuals concerned would forward a meaſure, evidently calculated to promote their own intereſt; provided they could obtain it by ſome *certain* and *known* means. It is the idea of giving up a *certainty* for an *uncertainty*, of entering the liſt of contending intereſts, and of being outwitted or overpowered by their neighbours, which deter men, whoſe fortunes are not deſperate, and whoſe

whoſe diſpoſitions are peaceable, from engaging in *conteſts* about Incloſures.

At preſent, a notice of a petition to Parliament, for the appropriation of unſtinted commons, implies the war-hoop—*havock!*—and he's the beſt fellow who gets the moſt plunder. And, until ſome GENERAL LAW OF INCLOSURE be eſtabliſhed, this *uncivilized* mode of procedure muſt neceſſarily continue.

The multiplication of ſtatutes has ever been ſpoken of as an evil; and though public acts may in general be meant, private bills may properly be included. There needs no apology, therefore, for venturing to recommend one Act of Parliament which would preclude the paſſing of a thouſand.

Pariſh Bills of Incloſure muſt occupy much of the attendance of Parliament, and divert their attention from matters of more public importance. Beſides, private intereſt, although it may not be able to exert its influence in Parliament at large, may be difficult to ſhut out, entirely, from its committees: but what can lower the dignity of Parliament more, than private intereſt being permitted, in any way, to warp its determinations?

That

That a GENERAL BILL OF INCLOSURE might be framed, to anſwer the purpoſe of an equitable appropriation of commonable lands, in a much higher degree, than has been, or perhaps ever can be obtained, by ſeparate bills, appears, to my mind, indubitable; and why ſuch a meaſure has not long ago been adopted, would be difficult for any man, out of Parliament, to conceive.

It would be improper, in me, to dictate to Parliament, and might be wrong to offer my ſentiments, too freely, in this place; but having ventured to cenſure the preſent mode of Incloſure by Act of Parliament, it is incumbent on me to convey ſome idea, of what I conceive would be an improvement.

In every townſhip, FOUR DISTINCT INTERESTS claim a right of ſharing in its commonable lands: namely, *lands*, *houſes*, *tithes*, and the *lordſhip*. The two former have a benefit in commons, in their open ſtate; but the benefit of the other two ariſes, ſolely, out of the Incloſure *. Hence it follows, that it

* The tithe of wool, lamb, and milk, only excepted; articles of ſmall value, compared with the tithe produce of lands, in a ſtate of cultivation.

1796. If, in any caſe, as in the appropriation of marſhes or fens, the eſtimate value of the tithes ſhould be greater, in

it is the conſent and approbation of the two former intereſts, which ought to be obtained, previouſly to a change from the open to the incloſed ſtate; for the two latter may be ſuppoſed to be always ready to receive propoſals for an Incloſure.

It has already been ſeen, that when the tithe and the lordſhip are able to draw over to them a third intereſt, they can gain the deſired point. But the evil effects of Incloſures, thus conducted, have alſo been ſeen. Therefore, in fixing a general rule, for the QUANTITY OF APPROBATION requiſite to an Incloſure, the other intereſts are more particularly to be attended to.

Were the lands and the houſes equally ſituated, with reſpect to the commons to be incloſed, *a majority* of each might be ſufficient. But this not being the caſe, in any townſhip, a larger proportion ſeems neceſſary. *Three fourths* might, in many caſes, be too ſmall; but as Incloſures are, in all human probability, beneficial to the public, it might be impolitic to fix it higher.

Thus

in the open than in the incloſed ſtate, the owners of ſuch tithes ought not only to have a diſſentient voice, but to have a ſuitable recompence.

Thus it appears to me, that, in framing a general law of Incloſure, *three fourths, in value, of the land,* and *three fourths, in number, of the houſes,* with the *conſent of the lord of the ſoil,* ought to be conſidered as the requiſite QUANTITY OF APPROBATION.

Authorized and guided, by a general law of this nature, the buſineſs of Incloſure would be ſafe and eaſy. Every man, before he ſet out, would know, with certainty, his proportional ſhare; and the Act would empower the ſeveral intereſts to make choice of commiſſioners, to ſecure to them their reſpective rights.

Numberleſs Incloſures remain yet to be made; and it were much to be regretted, that the attention of Parliament ſhould be ſo unprofitably employed, and that the property of individuals ſhould be ſubjected to ſo much hazard, as it is to be feared they will be, while common lands are continued to be appropriated, by SEPARATE BILLS, without any ESTABLISHED PRINCIPLES OF INCLOSURE *.

* June 1796. During the laſt ſeſſion (1795-6), a Bill, of the intention here propoſed, was brought into Parliament, by the Preſident of the Board of Agriculture. But Parliament being diſſolved, before the Bill had paſſed the lower Houſe, it now remains in ſuſpence, for the deciſion of the new Parliament.

4.

FARM BUILDINGS.

I. THE BUILDING MATERIALS, which are now in common uſe, on *this* ſide of the Vale, are chiefly,

Stones,
Pantiles,
Deal:

But there are other materials, which require to be noticed; namely,

Bricks,
Cement,
Oak.

1. STONES. The ſtones, in uſe, are of two kinds: *freeſtone* and *limeſtone* *. The former

* In the quarries from which theſe materials are drawn, the limeſtone generally forms the upper ſtratum, riſing to within a few inches of the ſurface. The ſoil, itſelf, is generally a limeſtone gravel; under which is frequently found a ſtratum of thin ſlatelike limeſtone, that increaſes in thickneſs, as the depth increaſes; from one to four or ſix inches thick; lying, in general, looſe and horizontal. Theſe are the "walling ſtones" uſed in the faces of buildings;

former being leſs periſhable, are uſed for foundations, coins, cornices, and the coping of ridges and gables; the latter, being more eaſily raiſed, and requiring leſs labor in dreſſing them for uſe, are, in farm houſes at leaſt, generally uſed in facing the walls; and when properly hammered, and properly ſorted, ſo as to give the thickeſt to the lower courſes, leſſening the ſize of the ſtones, from five or ſix to three or four inches thick, as the building riſes, a much *neater* material cannot be employed; nor, if kept free from conſtant moiſture, one which is more laſting, or which preſerves the face of youthfulneſs ſo long.

2. PANTILES. Formerly, *ſtraw* and a heavy kind of *ſlate* were the common coverings; but, of late years, *pantiles* have become univerſal, for ordinary buildings; and *blue ſlate* for better houſes.

In the ſouthern counties, pantiles are conſidered as an ordinary material: but the

ings; for which uſe, one of their edges is *hammered* into a bricklike form: an operation ſomewhat tedious; but not equal to that of *chiſſelling* freeſtone. Under the walling ſtones, an irregular limeſtone rock (of many feet in depth perhaps) is uſually found; and, under this, a bed of grit, or freeſtone, of unfathomed depth.

eſtimation of them, there, ariſes from an improper method of uſing them; not from any intrinſic demerit of the material itſelf, when properly manufactured. From London to Grantham in Lincolnſhire, ſcarcely a roof of pantiles occurs: north of Grantham, they are become the almoſt univerſal covering. They have two qualities ſufficiently valuable to recommend them in any country: cheapneſs and lightneſs.

Much, however, depends on the *manufacturing*, as well as on the *laying*, of pantiles. If the materials be not ſufficiently expoſed to the action of the air; or, if of diſſimilar natures, though ſufficiently tempered, they be not united *ſufficiently* into one homogeneous maſs, or uniform ſubſtance, the tiles that are made from them are liable to periſh; not only before burning, as well as in the kiln, but after being expoſed to the influence of the atmoſphere, upon the roof of a building. Or, if the materials be good and well prepared, the moulds be truly made, and the moulding ſkilfully executed;—ſtill, if they be ſuffered to warp in drying, or to twiſt in being ſet injudiciouſly in the kiln, they are wholly unfit to be laid on, as a covering material; and every judicious workman refuſes them.

them. Were workmen, in general, or thoſe who have the ſuperintendency of workmen, more ſcrupulous, in this reſpect, than they generally are, manufacturers would be more diligent in their endeavours to approach the ſtandard of perfection; by which means this, in many caſes, moſt eligible covering might grow into univerſal eſtimation.

3. DEAL. In a Diſtrict, furniſhed with three conſiderable ſea ports, and a river navigation, it is no wonder that deal ſhould have been long in uſe, as a building material. Floors have been laid with it, for near a century; and, of late years, it has been uſed for almoſt every purpoſe of building. Beams, joiſts, and entire roofs, are now, almoſt univerſally, made of fir timber.

4. BRICKS. Where ſtones are far to be fetched, as towards the center of the Vale, bricks are become a common material. If brickearth be found near the ſite of building, as it generally may in ſituations where ſtones are ſcarce, clamp bricks are conſidered, in this country, where coals may be had at a moderate price, as the readieſt and (all things conſidered) the cheapeſt walling material.

5. CEMENT. Formerly, ordinary ſtone buildings were carried up, entirely, with

"mortar;" that is, common earth beaten up with water, without the ſmalleſt admixture of lime. The ſtones, themſelves, were depended upon as the bond of union; the uſe of the "mortar" being merely that of giving warmth to the building, and a degree of ſtiffneſs to the wall.

The event, however, proves that walls built without lime have, in many inſtances, ſtood for ages. Even part of the walls of PICKERING CASTLE, formerly eſteemed a fortreſs of conſiderable ſtrength, have been carried up with a cement, which, to *appearance*, ſeems little ſuperior to common mortar: nevertheleſs, ſuch is the effect of time, upon walls which are expoſed on every ſide to the atmoſphere, that they now hold together with conſiderable tenacity.

To this effect of time; or, more accurately ſpeaking, to certain laws of nature which, in proceſs of time, produce this effect; we ought, perhaps, to aſcribe the ſtonelike contexture of the cements of ancient walls, rather than to any ſuperior ſkill in preparing them.

The citadel, or central ſtronghold, of the fortreſs under notice, has been built with better cements; which, however, vary much

in

in outward appearance. One ſpecimen, which I have collected, is a ſmooth chalklike ſubſtance; another, a coarſe rough maſs, compoſed of ſand and ſmall gravel, with a ſmaller proportion of chalklike matter.

In the foſſe, which ſurrounds the outer wall, lies a fragment (perhaps part of the parapet or embraſures of the outſide wall), whoſe cement has acquired a ſtonelike hardneſs, eſpecially the part which is expoſed on the outer ſurface *.

I have beſtowed ſome attention on the decompoſition of theſe four ſpecimens. The reſults are as follow:

EXP. 1. CEMENT OF PICKERING CASTLE: —the *coarſer* ſpecimen, taken from the ruins of the *central tower*.

In *general appearance*, it reſembles dirty chalk, thickly interſperſed with ſmall gravel; ſome of the granules as large as peas. Its *tenacity* that of common writing chalk; the aſperities eaſily broken off with the fingers.

* The age of this fortreſs would perhaps be difficult to aſcertain. Part of the outer wall was repaired and ſome towers raiſed by (I think) Edward VI. But when the parts, which are here the ſubject of notice, were erected, is probably uncertain. They are ſaid to be of very great antiquity; and are worthy of the reſearch of the Antiquary.

One hundred grains, pounded, dried, immerged in water, and balanced together with the menſtruum, loſt in ſolution 25½ grains of air, and yielded by filtration 40 grains of reſiduum; which afforded, by elutriation, 35 grains of gravel and rough ſand, and 5 grains of ſuſpendible mudlike matter: the ſolution yielding, by precipitation, 64 grains of calcareous earth.

35 grains of ſand and gravel,
5 grains of ſilt,
64 grains of pure chalk,

104 grains.

From this analyſis it appears,

1. That the *proportion* in this caſe (ſuppoſing crude limeſtone in lumps fit for burning to be of equal weight with ſand and gravel) was three meaſures of unſlaked lime in lumps, to two of ſand and gravel.

2. That the ſand and gravel, in this caſe, had been *waſhed*; either by the brook, which runs at the foot of the Caſtle mound, or more probably, by hand; the proportion of dirt being ſmaller than that which is generally found among *drift ſand*.

3. That the lime had not regained the whole of its *fixt air*. The increaſe of weight, which

which appears in the ſyntheſis of this experiment, is a ſufficient evidence, were it not corroborated, even unto proof, by the deficiency of air thrown off in the ſolution. To try whether the increaſe, on one hand, and the deficiency, on the other, agreed as to quantity, I reſuſpended 50 grains of the chalk obtained in this experiment: it loſt exactly 23 grains in ſolution; as 50 : 23 : : 64 : 29½. Therefore, the increaſe of weight, in this caſe, appears to be wholly owing to the deficiency of air.

EXP. 2. CEMENT OF PICKERING CASTLE; —*finer* ſpecimen of the *central tower*.

General appearance that of ſtale lime, run together with water, and baked to a cruſt: almoſt a pure white: ſurface rough; ſhewing the cells and the unbroken granules of the original lime.—*Contexture*, more brittle than common chalk; full of pores; the materials do not appear to have been well incorporated, at the time of preparation.

One hundred grains yield, in decompoſition, twentyone grains of air.

42 grains of whitiſh grit,
5 grains of ſuſpendible duſtlike particles,
56 grains of pure chalk,

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103 grains.

OBS. The reſiduum, in this experiment, is evidently *the powder of freeſtone*. The particles are ſmall, and of irregular figures; very different in appearance (when magnified) from common ſand. I was at a loſs to aſcertain their nature, until pounding ſome freeſtone, and waſhing it in the manner I had done the reſiduum, I found it to reſemble exactly the fortytwo grains of waſhed grit of the experiment. It appears to have been pounded or ground very ſmall, and to have been put through a fine ſieve; the whole being in a ſtate of *grit*; no fragment ſo large as a pin's head.

It is obſervable, that the cement of this experiment is *weaker* than that of the laſt: but whether from the nature of the *baſe*, or from the *proportion* of lime being leſs, or from the two united, is not evident.

It is alſo obſervable, that, in the decompoſition of this ſpecimen, a urinous ſmell roſe, during the ſolution; and that the edges of the firſt filter attract moiſture from the air. It is at preſent a practice, among ſome plaſterers, to make uſe of urine in the preparation of plaſter.

EXP. 3. CEMENT OF PICKERING CASTLE: taken from the ruins of the *old outer wall* facing

facing the northweſt. Collected in three or four different places; a few feet above the foundation; and moſtly from the inner parts of the wall (where it has parted); not from the outer ſurface.

Its *appearance* is that of ſandy loam, interſperſed with ſpecks of chalk; ſome of them larger than peas. Its *fragility* ſimilar to that of dried brickearth.

One hundred grains of this ſpecimen yield thirteen and a half grains of air.

30 grains of rough ſand, and a few large fragments,
37 grains of ſilt and fine ſand,
36 grains of calcareous earth.

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103 grains.

Obs. There are two cauſes of the *weakneſs* of this cement: the ſmall *proportion* of lime, and the impurity of the *baſe*: a heterogeneous maſs of fragments of various kinds, ſome of them apparently gypſeous; of ſands of different ſpecies, principally of a cryſtalline aſpect; but chiefly of mere mud, or of ſand ſo fine as to be impalpable between the fingers. It is therefore evident, that the materials, in this inſtance, have *not* been *waſhed*.

Exp.

EXP. 4. CEMENT OF PICKERING CASTLE: taken from a *fragment* in the northweſt corner of the foſſe.

In *general appearance* ſomewhat reſembling the laſt noticed ſpecimen; but in *contexture* very different. The cruſt of the outer ſurface, which has been expoſed to the influence of the atmoſphere, probably, during many centuries, has acquired almoſt the hardneſs of limeſtone: nor is any part of it to be broken with the fingers: nevertheleſs, this ſpecimen, alſo, is full of lumps of unmixed lime; ſome of them the ſize of ſmall hazel nuts, and, at the time I took the ſpecimen (the ſeaſon wet), as ſoft almoſt as butter; when dry, they are of the conſiſtency of very ſoft chalk.

One hundred grains of this ſpecimen yield fifteen grains of air.

8 ——— grains of fragments,
12 ——— coarſe ſand,
36 ——— fine ſand,
3 ——— of a ſizelike matter,
45 ——— chalk.

104 grains.

OBS. The conſtituent parts of this reſiduum reſemble thoſe of the laſt ſpecimen; except-

excepting the abſence of the mud, which has evidently been *waſhed* away; and excepting the preſence of a mucilaginous matter, whoſe nature I am not at preſent able to gueſs; nor have I leiſure, at preſent, to purſue the enquiry.

GEN. OBS. 1. All theſe cements, whether weak or ſtrong, have laid hold of the ſtones with a degree of firmneſs proportioned to their reſpective ſtrengths. Every crevice of the wall is filled with cement: the whole form one united maſs.

Hence, it is more than probable, that theſe cements have been poured into the walls, in a liquid ſtate, in the ſtate of *puddle*; and they appear to have operated, with reſpect to compactneſs, as the *puddle* of the canal-makers.

2. The ſubjects of EXP. 3. and 4. are ſtrong evidences, that, in the preparation of theſe puddles, the antient builders were very deficient. Not more than half of the lime they contain appears to operate. The lumps, whether large or ſmall, are *more* than waſted; weakening, rather than ſtrengthening, the cement.

3. From the whole of theſe experiments, it is evident, that the ſeveral cements had acquired the principal part of their fixed air; chiefly,

chiefly, perhaps, after they were depoſited in the buildings. The air in the ſtronger ſpecimens bears a conſiderable proportion to the entire quantity of cement; and being inſinuated, in the cloſe ſtate above-mentioned, may have added greatly to its *compactneſs*.

Hence, it is highly probable, that the ſtonelike tenacity of old cements is chiefly owing to the tranſmutation of lime and ſand to calcareous earth and ſand;—a ſubſtance reſembling the original limeſtone.

On examining a wall, which has been built with loam alone, without any admixture of lime, and which has probably ſtood about a century, I find that the loam has laid no hold whatever of the ſtones, and that time has made no alteration on its contexture. It is ſtill the ſame friable ſubſtance, it probably was, the day it firſt became dry in the building; without having the ſmalleſt appearance of acquired tenacity, obtained during the century of time it has been expoſed to the influence of the atmoſphere.

It is therefore probable, that the atmoſphere imparts nothing, *voluntarily*, of a coheſive nature to the mortar of walls which are expoſed to it.

But it is more than probable, that cement, con-

containing a portion of *lime*, imbibes from the atmoſphere ſomething, which gives it a degree of tenacity, ſuperior to that which it had on its firſt becoming dry in the wall; and it is a fact, well eſtabliſhed, that lime begins to imbibe, the moment it grows cool from the kiln, *that* which the fire has deprived it of; namely, fixed air; which fixed air being imbibed, after the cement is depoſited in the walls, is, *probably*, a principal cauſe of tenacity.

This being admitted, it may ſeem to follow, that the more quickly it is transferred from the kiln to the building, the greater portion of air will be imbibed, after it is laid in the walls, and, of courſe, the greater effect will *time* have on the tenacity or coheſion of the cement: and hence, we might be led to infer, that, if the antients had any ſuperior ſkill in this matter, it conſiſted in their haſtening the lime from the kiln to the building.

But, in practice, it is obſerved, that freſh-made mortar does not *ſet* ſo well, does not cohere into a ſoft ſtonelike ſubſtance, ſo readily, as that which has been prepared ſome time before it be uſed.

This fact, perhaps, is accounted for in the lime having had, under this circumſtance, time

time to lay hold of the particles of *ſand*, with which it is intermixed.

But, on the ſame principle, it ſeems to follow, that if the preparation be made too long before the mortar be laid into the wall, it will have regained too much of its fixed air, to lay hold, ſufficiently, of the *ſtones*, or other materials, which it is intended to bind together.

Let this be as it may, it is common, in practice, when mortar is not uſed, preſently after making, to cover it up cloſely from the outward air. It is the opinion of a perſon, who has paid this ſubject conſiderable attention, that, if mortar be buried within the ſurface of the ground, it may be kept twelve months in perfection.

The ſame perſon, whoſe penetration and judgment, in the few ſubjects he has more particularly employed his mind upon, are ſuperior to thoſe of moſt men, has ſtruck out a new idea relative to the *ſlaking* of lime for mortar.

Lime, whether it be intended for cement or for manure, ought to be reduced entirely to a dry *powder*. And, for cement, it ought to be mixed, in this ſtate, evenly and intimately with the ſand.

It

It is difficult, if not utterly impoſſible, to reduce lime *entirely* to *powder*, with *water* alone; ſome part or other will always be ſuperſaturated, and thereby be reduced to a *paſte*; while the outſides, which are expoſed to the atmoſphere, will (unleſs the ſtone be extremely *fine*) fall in *granules*, not into powder.

Every piece of paſte, and every granule, though but the ſize of a pea or a muſtard ſeed, is uſeleſs, if not detrimental to cement; for, with theſe, the grains of ſand cannot be intimately mixed; much leſs be coated with them; as they may, and undoubtedly ought to be, with *lime in powder*.

But if, inſtead of water, *wet ſand* be uſed in ſlaking the lime; (piling it with the lime in knobs, layer for layer, and covering up the heap with it;) thoſe evils are avoided: no part is ſuperſaturated, nor are any granules formed by the action of the outward air.

Beſides, another great advantage is obtained by ſlaking the lime, in this manner, with the ſand with which it is intended to be incorporated. The two ingredients, by being, perhaps, repeatedly turned over, and by paſſing through the ſieve together, ne-

ceſſarily become intimately blended; more intimately, perhaps, than they could be mixed, by any other proceſs, equally ſimple. If the ſand be *waſhed* (and all ſand mixed with lime for cement ought to be waſhed) the labor of preparation is, by this method of ſlaking the lime, conſiderably leſſened.

But, in the preparation of cement, SLAKING THE LIME makes only one ſtage of the proceſs; MIXING THE INGREDIENTS intimately, and uniting them cloſely together, into one compact homogeneous maſs, is an operation which requires the ſtricteſt attention.

We have ſeen the uſeleſsneſs of unburnt lumps of lime in cement; and the good effect of *puddling* cement has been at leaſt conjectured.

Compactneſs ſeems to be eſſential to the *hardneſs* of cement. When mortar is laid on with the *trowel*, it remains in the ſtate in which it is laid, and does not run together into a cloſe form, like melted metal or LIQUID CEMENT.

Much care, therefore, is requiſite, in the preparation of mortar for the TROWEL. Working it, with the ſpade alone, is inſufficient. Beating it with the edge of a board, a kind of

of wooden axe, is more efficacious, but is very tedious. MILLS for the grinding of clay are common, and ſufficiently effective of the purpoſe intended: but a mill, for the grinding of mortar, I have not yet ſeen, nor have I ever heard of ſuch a contrivance.

6. OAK. This is, now, almoſt wholly laid aſide, as a material of the houſe carpenter; except for door and window lintels, wall-plates, and ſome few other purpoſes, which require ſtrength and durability. The ports of Whitby and Scarborough take off the larger timber; and the refuſe has, of late, been much in demand, for the purpoſe of incloſure. Deal has of courſe gained ground, as a building material. There are, however, ſome few men, who ſtill retain a ſufficient partiality for the oak, to uſe it freely in every ſpecies of building, under a full perſuaſion that, in the end, it will prove the cheapeſt material.

Having thus enumerated the materials of building, in moſt common uſe in the Diſtrict, I will proceed to give ſome account of the BUILDINGS themſelves; and of ſuch OPERATIONS, in rural architecture, as merit particular notice.

II. FARMERIES. The ſpirit of improvement, which has ſo evidently diffuſed itſelf through this extenſive county, is in no particular more conſpicuous, than in Farm Buildings; nor, perhaps, does any part of it afford ſo many ſtriking *innovations*, in this particular, as that which is under ſurvey.

The FANCY FARM-HOUSES, which have been erected in different parts of it, I purpoſely paſs over. Taſte, whether true or falſe, mere ornament without uſe, is foreign to the preſent ſubject: and I have, in another work, profeſſedly on the ſubject of RURAL ORNAMENT, ſpoken my ſentiments freely, on ornamental buildings.

In RURAL ECONOMY, ſtraight lines and right angles are firſt principles, which can *ſeldom* be deviated from, with propriety; either in laying out a farm, or in planning Farm Buildings.

Here, the great object is to obtain the deſired conveniences, at the leaſt expence, preſent and future taken jointly, ſo long as the given conveniences may be required. To theſe principles we may venture to add,—the greater number of conveniences there can be included, in one building, the cheaper will thoſe conveniences be obtained.

There

There is a certain width, which can ſeldom be exceeded, with propriety, in Farm Buildings; but the nearer this width is approached, the greater quantity of convenience will, in general, be obtained with a given expenditure. The long cube form, with the plain ſpan roof, can never be diſpenſed with, without evident impropriety, in conſtructing Farm Buildings.

The number of Incloſures which have, of late years, taken place, and the ſpirit of improvement, which has gone forth upon the Wolds, have given exiſtence to FARMERIES of almoſt every form and dimenſion.

The practice of houſing cattle in winter, which will be ſpoken to hereafter, requires a greater quantity of building, than that of wintering them in the open yard. But the quantity of barnroom requiſite in this country, even on the arable farms, is much leſs than in the ſouthern provinces, where barley and oats are harveſted looſe, and where the ſhovel, or the ſail fan, is uſed in the dreſſing of corn. Here, corn is univerſally bound, and the machine fan in almoſt univerſal practice. In Norfolk, *one* man expects a floor of fifteen feet by twentyfour to himſelf; here, *two* men will thraſh, contentedly, on a floor, nine

feet by twelve; ten by fifteen is a full ſized floor.

Such being the requiſites of a Yorkſhire Farmery, it is no wonder that the new ones, which have been erected, ſhould be compoſed of a ſtring of ſmall buildings. They are generally formed into a ſquare, open to the ſouth, in imitation of thoſe of other countries, where cattle are wintered in the area between the buildings, not in the buildings themſelves.

In one inſtance, I have obſerved the cattle hovels ſpun out, in ſuch a manner, as wholly to incloſe the dung yard. But the hovels, in this caſe, were only ſeven feet wide; not wide enough for cattle to ſtand acroſs them; they being placed in them, lengthway, in pairs. The quantity of walling, the number of doors, &c. and the quantity of roofing, with the ſubſequent repairs incident to low ſtraggling buildings, render this, and every other plan which reſembles it, altogether ineligible, in any Diſtrict where cattle are wintered under cover. Wide houſes, or open ſheds, wide enough to permit cattle to ſtand acroſs them, are in many reſpects preferable.

In oppoſition to the Farm Yard laſt mentioned, there is, likewiſe in this neighbourhood, an inſtance of the entire Farmery (of a ſmall

ſmall upland farm) being compriſed under one roof!

The ſite is a long ſquare. One end is occupied by a ſmall dwelling place for a "hind," or bailiff; the ground floor of the remainder, by a ſtable and cattle houſes; over which are a barn and hay chamber; with a CHAMBER BARN-FLOOR! a thing I had not ſeen, nor conceived an idea of, before I obſerved it, in more inſtances than one, in this Diſtrict.

This, juſt noticed, is the only one I have ſeen, in a *new* erection; I have, however, had full opportunity of obſerving the uſe of another, thrown over a cow houſe, in a large old building, which had long been uſed as a barn, ſtable, and beaſt houſe.

The advantages of a CHAMBER BARN-FLOOR are dryneſs, cleanneſs from dirt carried in with the feet, and ſecurity againſt pigs, poultry, and various accidents, to which ground floors are more liable: for thraſhing *wheat* upon, chamber floors are obviouſly preferable to ground floors; moſt eſpecially in low dirty ſituations.

No eſſential diſadvantage has yet ſtruck me, reſpecting a chamber thraſhing-floor; but with reſpect to a CHAMBER BARN,

there is one which is obvious; namely, that of having the corn at harveſt, a buſy ſeaſon, to raiſe one ſtory higher than ordinary.

If a barn be built againſt a riſing ground, this objection falls, in part, or wholly. Even on plain ground, it appears to me that (eſpecially where cattle are houſed) it would be greatly overbalanced by the advantage of obtaining a ſuite of ſtables, cart houſe, and cattle houſes, without the expence of roofing, in the firſt inſtance; and which, if ſubſtantially built, would laſt for ages to come without repairs.

The flooring of a chamber barn might, on the whole, be ſomewhat more expenſive than that of a ground-floor barn; but the thraſhing floors, if of plank, would be laid cheaper, and laſt much longer, in the former, than in the latter ſpecies of building; and the mow floors, if laid with clay on rods *, would ſoon regain their extra coſt, in keeping the bottoms of the mows dry and ſweet; and in preſerving it more ſecure from vermin, than ground floors generally do.

It is not my intention, even to intimate, that in corn countries, ſuch as Norfolk, Kent,

* See THE RURAL ECONOMY of NORFOLK, MIN. 15.

Kent, and other Diſtricts, where cattle are wintered in yards, that chamber barns would be univerſally eligible; but, in a country like this, or in any country, or on any farm, on which graſsland predominates, and where the houſing of cattle is practiſed, I ſee no ſufficient objection to chamber barn-floors, nor to entire chamber barns. On the contrary, it appears to me, that, on ſmall graſſy farms, in low damp ſituations at leaſt, they would be found ſingularly eligible.

But although a cloſe yard is unneceſſary, where cattle are houſed, a ſingle building, like that which was laſt deſcribed, is perhaps too ſimple, to be altogether eligible; eſpecially in an expoſed ſituation, where ſome degrees of ſhelter are requiſite.

Two buildings, properly placed, would give this neceſſary ſhelter; one of them a barn, with offices under it; the other, the dwelling houſe, placed at right angles with the former: the two buildings touching at the corners only; forming two ſides of a ſmall yard with their ends, for hogs, poultry, &c. and a larger one with their fronts, for the dungpit, &c. with a ſmall archway communication between them.

This, however, is intended by way of hint.

hint. To enter into the particulars of a plan, which I have not ſeen executed, would be breaking into the deſign of the preſent work: nevertheleſs, it might be wrong to ſuppreſs this idea (which ſtruck me while I was ſketching a plan of a Farmery on the above principles) with regard to ASPECT.

It is uſual, in planning a farm yard, to place the main line of building with its front to the ſouth; in which caſe, two wings become neceſſary to ſkreen the yard from northeaſt and northweſt winds: and perhaps this has eſtabliſhed the common practice of incloſing a farm yard, on three ſides, with buildings.

But if, inſtead of the back of a building being placed to the north, the angle of two buildings were directed to that point, the yard would be moſt effectually ſkreened from the north, the northeaſt, and the northweſt wind, without an unneceſſary multiplication of low narrow buildings, to eke out a third ſide with.

On a capital corn farm, on which a number of ſubſtantial buildings are required, three lines of building may be eligible; but on any ſmall farm, or on almoſt any farm on which graſs lands abound, two lines of building, forming a cheveron or carpenter's ſquare,

and

and placed with the *angle towards the north*, would, in my opinion, be greatly preferable.

Another idea in RURAL ARCHITECTURE, new to me as that of a chamber threſhing-floor, I have ſeen executed, in a ſubſtantial manner, by two of the firſt occupiers in the Vale; namely, A GRANARY OVER A BARN FLOOR.

In all other barns I have ſeen, the ſpace over the floor, whether this be large or ſmall, and whether the building be low or lofty, remains entirely uſeleſs *. The idea of occupying the lower part of this ſpace with a cattle houſe, as well as that of filling the upper part of it with a granary, have perhaps been originally and recently ſtruck out, in this country †.

In the two inſtances in which I have ſeen GRANARIES OVER BARN FLOORS, the joiſts are ſupported by two beams, thrown acroſs the building, and the flooring of the granary, let

* Except in one inſtance, in which a very ſpacious building having been converted into a barn, joiſts were thrown acroſs out of the reach of the flail, and the mows continued over the floor.

† Since this was written, I have been informed, that, in ſome parts of America, chamber barns, over cattle houſes, are in common uſe. 1796.

let into the walls, at the ends; ſo that, notwithſtanding the granaries may be ſurrounded with vermin, they are, in a degree, ſecure from their attack.

In the floor is a trap door, with tackle over it, to raiſe and lower the corn from and to the barn floor.

The height, between the floors, is thirteen feet. This, in my opinion, is too great a height. Ten feet high is the moſt the flail requires *; and every inch above that height renders the granary, in many reſpects, leſs commodious.

Confining the duſt, which always riſes more or leſs in thraſhing, appears to be the only objection to a BARN-FLOOR GRANARY: I mean in a barn with pitching holes to houſe the corn at. But if VENTILATORS were made, immediately under the granary floor, with valves to open or ſhut as the wind ſhould change, the health of the thraſher would, in all probability, be leſs injured, than it generally is, by this laborious and unhealthful employment.

Indeed, in this country, where tall, wide folding BARN DOORS are grown into diſuſe, vent

* See NORF. ECON. MIS. 35.

vent holes of this kind are, in ſome degree, neceſſary to every barn floor. Even upon the Wolds, a corn country, the uſe of large doors is declining: ſome good barns have lately been built, with common-ſized doors; one at each end of the floor: opening, however, in two parts, one above the other; ſo that the lower half can be ſhut, to keep out pigs and poultry, while the upper one is opened, to let in light and air.

This is a *fortunate* circumſtance for the owners of landed eſtates: folding doors, large enough to admit a load of corn, are expenſive in the firſt inſtance, and frequently require repairs; beſides the thraſhing floor, be it of what material it may, being liable to great injury, in the act of drawing loaded waggons upon it.

Indeed, throughout, the YORKSHIRE BARN is characterized by frugality. In Norfolk, barns of one hundred and fifty to two hundred pounds coſt are not unfrequently built: here, a very convenient one, and ſuch a one as will ſatisfy a good tenant, may be built for forty or fifty pounds. What a ſaving is this, upon a large eſtate!

III. The OPERATIONS which require to be noticed are,

1. The

1. The method of laying pantiles.

2. The method of coping ridges and gables.

3. Eaves gutters.

4. Water ciſterns.

5. Painting window leads.

6. Mortar floors *.

1. LAYING PANTILES. Formerly, it was the practice to hang pantiles upon the naked ſpars, bedding their ends in mortar, and pointing them at the ſides, to prevent ſnow and rain from being beaten through, between them.

This method has two evil effects: lime is liable to expand, contract, and periſh with the weather; to which, in this caſe, it is fully expoſed. The conſequence was, if the cement laid faſt hold of the tiles, it broke them; if not, it ſlid from between them, and left the roof room expoſed to the weather. The other bad effect of this method is, their being liable to be thrown off, in high winds, by the inward air being pent up, and finding an eaſy paſſage through this ſlight covering.

To remedy theſe two evils, it has, of late years, been the common practice to "ſheet" the

* Particulars which are intereſting to thoſe, only, who practiſe in Rural Architecture.

the roof; that is, to interlath, with plaſtering laths, between the tiling laths, and to cover the entire roof with a ſheet of lime mortar: and over this, to lay the tiles on "dry;" that is, without bedding or pointing them; being careful not to ſuffer any part of them to touch the mortar:—to prevent which, the moſt effectually, a ſlip was nailed on, between the ſpars and the tiling laths, to raiſe the tiles ſufficiently above the ſheeting.

This method, which has been practiſed ſome fifteen or twenty years, has been found effectual, againſt the two inconveniences above mentioned; but it has lately been found, that, in twelve or fifteen years, the laths begin to fail; owing, it is ſuppoſed, to their being placed too near the outward air; from which the lime alternately abſorbing and imparting moiſture, the laths become ſubjected to decay. I am rather of opinion, however, that this effect is cauſed by the tiling laths, checking the deſcent of the rain or ſnow water, which beats in between the tiles. Or it may be owing jointly to the two cauſes.

Be this as it may, an improvement has lately been ſtruck out, which brings the art to as great perfection, perhaps, as it is capable of.

of. This improvement conſiſts in nailing the plaſtering laths *beneath*, inſtead of *upon*; the ſpars; laying the main coat of plaſtering *above* the laths, between the ſpars; afterwards, ſmoothing the under ſide with a thinner coat. This method removes the cement from the more immediate action of the atmoſphere, gives a free circulation to the air and the water (which may be beaten in) between the tiles and the plaſtering; and, at the ſame time, gives neatneſs to the room beneath; without the expence, or the inconveniency, of a counter ceiling.

There is one very great conveniency ariſes from laying on pantiles dry. If, by the wind, or by accident, a tile be thrown off or broken, it may be replaced by a plowman, as well as by a profeſſed tiler: a conveniency, which upon a farm, perhaps at a diſtance from workmen, is of no ſmall value.

2. COPINGS. *Ridge Tiles*, being laid entirely on mortar, and being expoſed in the fulleſt manner to the action of the winds, are very liable to be thrown off; as well as to be broken by the weather: it is no uncommon thing, in places where ridge tiles are uſed, to ſee half of them diſplaced or broken; the heads of the ſpars having nothing

nothing but the mortar to hide them, without any thing to defend them from the weather. The ill conſequence is evident.

In this country, where freeſtone which will ſtand the weather abounds, RIDGE STONES are in common uſe.

The form triangular; the half of a long ſquare, divided diagonally. The baſe or broadeſt ſide is hollowed, to receive the top of the tiles: the oppoſite angle forms the ridge. The angles of the baſe are generally dreſſed off, to prevent the wind from laying hold of them; and to give them a more ſnug and neat appearance. They are ſet on with mortar, in the ſame manner as ridge tiles are laid.

The *coping of gables*, let the walling material be what it may, is uſually of dreſſed ſtone, ſupported, at the foot, by an ornamental bracket of the ſame; projecting ten or twelve inches without the ſide walls; giving a degree of lightneſs, and an appearance of conſequence, to the building.

The end of the firſt ſtone of the coping reſts on this corner bracket; the others, reſpectively, on thoſe next below them.

There is an evil effect attends the common method of putting on theſe copings: the ends

of the ſtones being uſually cut ſquare, and laid fluſh with each other, to prevent their ſlipping, and to give them a ſmooth uniform appearance, the joints between them, when the mortar begins to fail, receive rain water, and conduct it into the end wall; by which means their principal intention, the preſervation of the wall, is rendered defective.

To prevent this effect, I have obſerved, in a few inſtances, an ingenious expedient practiſed. The upper ends of the coping ſtones are pared down, to about half their common thickneſs (as from two inches thick to one), with a ſlope, ſufficient to give deſcent to water, when they are laid upon the gable: and the lower ends have notches cut on their under ſides, to receive the reduced points of the upper ends, about an inch beneath them.

By this expedient, the water is effectually got rid of, without endangering the firmneſs of the coping; but ſimplicity being, by this means, diſturbed, the eye is diſpleaſed, with what however is, upon the whole, a very valuable improvement *.

On

* Perhaps, giving the upper ends of the ſtones, a wedge-like form, and cutting bird's mouths in their lower ends, to receive the points, would be an improvement.

On *this* ſide of the Vale, the Morelands afford, in great abundance, ſtones well ſuited to theſe purpoſes: but, on the Malton ſide of the Diſtrict, freeſtone is leſs abundant: nevertheleſs, ſuch is the conveniency of inland navigation, the Derwent brings a ſupply of thoſe uſeful materials, ready dreſſed, and fitted for uſe. And now, when inland navigations are become ſo prevalent, there is ſcarcely a diſtrict in the kingdom, which might not be ſupplied with them, from one place or other, at a moderate expence *.

3. EAVES GUTTERS. The troughlets made uſe of to catch rain water, dripping off the eaves of roofs, are uſually formed by nailing two narrow ſlips of board together: but eaves troughs, made in that manner, are liable to warp, and become leaky at the joint; —the bottom;—the moſt eſſential part.

Here, they are pretty univerſally hollowed out of *a triangular piece of wood*,—with a round-mouthed adze. A piece, ſix to eight inches ſquare, ſlit diagonally, affords two

* The price of the ſtones, which are raiſed near Leeds, and carried, by water, down the Air, and up the Derwent, to Malton, are as follow: *Ridge ſtones* fifteen pence a yard, or five pence a foot: *Copings* the ſame price: *Brackets* two ſhillings and ſixpence each.

triangular pieces fit for this purpoſe. The hollowing is not a work of ſo much labor as theory may ſuggeſt. They are uſually made of deal. Gutters thus made are ſtiffer, and more eaſily ſupported,—are leſs liable to warp, and much leſs ſubject to leak,—than thoſe made in the uſual manner.

4. WATER CISTERNS. In Surrey and Kent, there are inſtances of wells, three hundred feet deep. The expence of tackle, and the expence of labor, in raiſing water, for every domeſtic purpoſe, and frequently for the uſe of ſtock, from this intolerable depth, would, it is natural to imagine, have long ago driven the inhabitants to ſome expedient, for collecting rain water: yet ſtill they draw water out of the bowels of the earth; or, in very dry ſeaſons, drag it perhaps three or four miles, uphill, in water carts!

In the iſland of Bermudas, and in ſome of the Weſt India iſlands, the inhabitants have (generally ſpeaking) no other freſh water, than that which they collect from the atmoſphere, in tanks; and it is ſtriking to ſee the ſmall quantity of collecting ſurface, requiſite to the ſupply of a family, with this neceſſary element; a ſurface which is ſmall, in compariſon

pariſon with the roofs of a middle-ſized farm houſe and offices.

In this Diſtrict, in which water ciſterns are growing into general uſe, eſpecially in upland ſituations, I have ſeen an inſtance where the dwelling houſe, alone, affords more than a ſufficiency of water, for every uſe of the family. Nor is it the conveniency of having a conſtant ſupply of water, always at hand, which alone conſtitutes the utility of water ciſterns. Rain water, preſerved in quantity under ground, is pure and palatable in a ſuperior degree: cool in ſummer, and warm in winter. It is particularly grateful to cattle; eſpecially when they are ill: and it is highly probable that, as a menſtruum of aliment in general, it is the moſt *wholeſome* water.

The *ſituation* of a water ciſtern is generally under the kitchen, or in a vacant corner of the yard, near the kitchen door.

The *forms* of water ciſterns are various. The deeper they are ſunk, the better they keep the water. The cube is perhaps the moſt convenient figure; but a double cube would perhaps keep water better. A ciſtern nine feet cubical would contain twenty-

ſeven cubical yards, or about ninety wine hogſheads of water.

The *materials* of water ciſterns, in this Diſtrict, are clay, bricks, and tarras.

The *method of making* has lately received a conſiderable improvement. When the art was leſs known, than it is at preſent, an irregular hole was dug; the determinate figure of the ciſtern being given by the walls; behind which the clay was *rammed*. Now, the intended form of the ciſtern when finiſhed, is given to the excavation; whoſe ſides are ſquared and plummed, with the exactneſs with which a wall is carried up. On this wall-like face of the excavation, the clay is laid *plaſter-wiſe* with a trowel, coat over coat, two or three inches thick; and againſt this firm even face of plaſtering, the brick work is raiſed. The bottom is, or ought to be in all caſes, bedded with three or four inches thick of ſtrong clay, beaten into a ſmooth even waxlike ſubſtance. On this flooring of clay, a double floor of brick is laid; and, on the margin of this, the ſide walls are carried up, half a brick thick. The bricks are, I believe, invariably laid in tarras.

The *covering* is ſimilar to that of a well; with a pump, or a roller and bucket. The latter,

latter, perhaps, the more eligible; eſpecially if the admiſſion pipe were carried down to near the bottom of the ciſtern; by which means the water, at the ſurface, would always remain undiſturbed and pure.

5. PAINTING WINDOW LEADS. This is not introduced as a thing of importance: but the practice ſeems to be peculiar to this country. It gives a degree of neatneſs pleaſing to the eye; and the paint is ſaid to be a preſerver of the lead. The color invariably white.

6. MORTAR FLOORS. A new ſpecies of cottage flooring has lately been thought of, and is now pretty commonly formed, in this neighbourhood.

The *materials* are lime and ſand; mixed in nearly the ſame proportion, and prepared in the ſame manner, as the common mortar of bricklayers; except, that for forming floors with, it is generally made ſtronger, and is always made up ſofter, than it is uſually done, for laying bricks in.

The *method*. The bed being prepared, the materials are carried on, in pails, in a ſtate between paſte and batter; laying them on four or five inches thick, and about one inch higher than the intended height of the

floor; to allow for the ſettling, in drying. The whole being well worked over with a ſpade, the ſurface is ſmoothed with a trowel; and, as it dries, is beaten, repeatedly, with a flat beater, to prevent its cracking; the workman, in this operation, ſtanding on planks.

A fortnight or three weeks of dry weather will render it ſtiff enough to walk upon.

If, after the laſt beating, croſs lines be deeply graven on the ſurface, a floor of cement has the appearance, as well as the uſefulneſs of a freeſtone floor.

5.

DRINKING PLACES.

IN DISTRICTS abounding with upland graſs, we may expect to find ARTIFICIAL DRINKING PLACES for the uſe of paſturing ſtock. But no Diſtrict in the kingdom will gratify our expectations ſo fully, in this reſpect, as that which is now under obſervation.

In

In this country, there are three ſpecies of artificial watering places:

1. Made Pools.
2. Made Rills.
3. Field Wells.

I. MADE POOLS. The art of "pond-making" ranks among the moſt uſeful arts in Rural Economics. In many high ſituations, no other expedient can be practiſed, with propriety: rills cannot be raiſed, nor wells ſunk and worked, but at too great an expence, for the purpoſe of watering ſtock.

On the hills of Surrey and Kent, ponds are made to hold water, tolerably well, with *chalk*, beaten firmly together *: and in Norfolk, I apprehend, they have been formerly made with *marl*. In all countries where unfathomed beds of *clay* are common, drinking pools ſufficiently retentive may, at a ſmall expence, and without much art, be formed; and are, in general, ſufficiently abundant.

But the art of making retentive pools, with CLAY, in *looſe abſorbent ſoils*, is a recent diſcovery,

* Experiments have, it is ſaid, been tried with chalk, upon the Yorkſhire Wolds, without ſucceſs; owing, probably, to the too great hardneſs of the Wold-chalk. A ductile ſoft chalk is fitteſt for this purpoſe.

diſcovery, which has been hit upon in this Diſtrict; in which it has made a rapid progreſs, and is now in univerſal practice, among farmers of every claſs. Indeed, for a country like this, where upland ſoil is kept principally in graſs, it may well be conſidered as the moſt valuable diſcovery which has lately been made in Rural Economy *.

There is little difficulty in making a pit hold water, with clay alone; provided it be kept up full to the brim; but once emptied, its retentiveneſs is loſt. There are two cauſes of this loſs of retentiveneſs:—the cracking of the clay by *drought*; and its being liable, whenever the water ſubſides, and even perhaps when filled, to be perforated by *worms*; which convert the baſon into a filter, and for ever deſtroy its retentiveneſs. It is therefore neceſſary, that thoſe two enemies ſhould be guarded againſt.

To guard againſt the latter, a coat of LIME is ſpread, under the clay: above it, a coat of EARTH,

* FRANCIS and ROBERT GARDINER, well-diggers and fiſh-pond makers, of Driffield, are entitled to much more than the *credit* of this diſcovery. The York Agriculture Society voted them a premium of ten pounds: were the Nation to grant them ten thouſand, it would not be more than they merit.

EARTH; and, over all, a covering of STONES is laid; for the double purpoſe of guarding againſt drought, and for preventing the feet of cattle from injuring the CLAY; which alone is the cauſe of retentiveneſs; and on the proper ordering of which the art principally depends.

But many other particulars are requiſite to be known, before the art can be ſufficiently underſtood, to be practiſed with certainty.

1. The Run, or collecting ſurface.
2. The Reſervoir.
3. Liming.
4. Claying.
5. Covering.
6. Time of making.
7. Coſt.

1. THE RUN. A bare firm ſurface, as a *road*, collects the greateſt quantity of water. A *graſſy ſurface* retains the rain water which falls upon it, and which, in *level* ſituations, is conducted into the ſoil, by wormholes and other inlets, with which graſsland generally abounds; eſpecially in ſummer, when a collection is of the greateſt value. However, if the ſubſoil be retentive, *ditches*, eſpecially of arable incloſures, will frequently afford a ſupply, even in ſummer; but, in an UPLAND SITU-

SITUATION, where the ſubſoil is generally abſorbent, a *road*, or an *artificial run*, becomes neceſſary.

In upland Diſtricts, as the Wolds of Yorkſhire, and the Downs of Surrey and Kent, the ſurface is generally broken into hill and dale, and diverſified by ſmaller vallies and inequalities. In ſituations of this kind, ARTIFICIAL RUNS are moſt wanted, and may be moſt eaſily made. I have ſeen ſome faint attempts at making them, on the Wolds of this Diſtrict, by cutting a few grips, with a ſpade, above the reſervoir; but they were too few, too ſhort, and too ſeldom ſcoured, to anſwer, in any conſiderable degree, the intended purpoſe. They, nevertheleſs, ſhewed plainly enough, the utility of channels for catching haſty ſhowers, falling on *graſſy ſlopes*, off which a conſiderable quantity of water will eſcape, provided there be channels, at proper diſtances, to receive it.

To reap the greateſt benefit from an artificial run, and to make it with the greateſt eaſe,—form the baſon at ſome conſiderable diſtance from the head of a valley; from which, down to the reſervoir, open a main channel, by two furrows of a plow, turned outward. From this main ſtem, plow lateral branches,

branches, with an eaſy deſcent towards it, along the ſides of the ſlopes, by ſingle furrows, turned downhill; by which means the plowing will be rendered eaſy, the channels made free on the upper ſides for the admiſſion of water, and high on the lower ſides for retaining it.

The plow would not be leſs expeditious, in ſcouring, than in making the channels: or, perhaps, a more ſledge-like implement would be ſtill more effectual, than the plow, in cloſing the fiſſures and wormholes, which preſently are formed in watercourſes laid dry; and which, if left open, abſorb an inconceivable quantity of water, before they be ſaturated; eſpecially if the current of water be retarded, by graſs, or other obſtructions.

2. THE RESERVOIR. The *ſituation* of the reſervoir depends principally on the run. Near the ſide of a road is, in general, the moſt deſirable ſituation; provided a ſufficient deſcent can be had, from the road to the reſervoir. Roads leading along the ſides of ſlopes can only afford a ſupply to the grounds on their lower ſides. But, in this country, when a road leads down the deſcent, it is generally furniſhed, on both ſides, with ponds; ſome of them, perhaps, not having more than a hundred

a hundred yards of run, off a narrow road way; yet, from that ſmall quantity of ſurface, are ſufficiently ſupplied with water.

In the *ſituation* of a pond, there is one thing requiſite, which does not ſeem to be attended to, even by the moſt ſkilful in the art. The requiſite I ſpeak of is that of admitting a waſte-water place, on the upper ſide of the reſervoir, to prevent the water, when the pond is full, from running *through* it; by which means it becomes filted up, unneceſſarily. For the nature of foul water is ſuch, that, whenever it changes from a current to a ſtagnant ſtate, it depoſites a conſiderable part of its foulneſs; ſo that the water, which leaves a full reſervoir, is finer, than that which enters it; the ſediment of courſe being left behind in the reſervoir. Whereas, if the current into the pond were to ceaſe when the pond is ſufficiently filled, the ſediment of the overplus water would be got rid of. The pond would receive, in this caſe, no other foulneſs, than that which was given by the quantity of water, requiſite to fill it *.

The

* A ſmall CATCH POOL, between the run and the reſervoir, would arreſt much of the foulneſs of water, collected from a road; and, in a ſituation which could admit of

The form of the reſervoir is, univerſally, that of a ſhallow baſon, or more ſtrictly ſpeaking, that of a flat cone inverted; the ſides ſhelving ſtraight from the brim to an angle or point, in the center. If the excavation be made ſixty feet diameter, its greateſt depth is about ſeven feet: if forty feet diameter, the depth is about five,—before the coats of clay, &c. be laid on *.

The firſt buſineſs, in *ſetting out* a reſervoir, is to take the level of the ſite, and drive piles, as a guide in forming the banks, and in making the conducting channel, and waſte-water place.

If the ſituation be on a *ſlope*, the excavated mold is uſed in forming the bank, on the lower ſide: if nearly *level*, the mold requires to be removed, or (if laid round the edge) the conducting channel to be raiſed.

If

of it, would be worth the trouble of forming. In many ſituations, the mud it might collect, would amply repay the expence of forming it.

* A reſervoir ſet out twentytwo yards diameter, by ſeven feet deep, will, when finiſhed, meaſure about ſixty feet by ſix, and will hold about two hundred and ten cubical yards, or near ſeven hundred hogſheads of water. Forty feet diameter by four feet deep, when finiſhed, contains ſixtytwo cubical yards, or two hundred hogſheads (of ſixty-three gallons, wine meaſure).

If clay or ſtone be excavated, it is laid ſeparately aſide, to ſave carriage.

If the lower ſide be raiſed with the excavated materials, they ought to be firmly worked together, or ſhould lie a ſufficient time to ſettle; otherwiſe, the ſide, thus formed, is liable to ſettle, after the reſervoir be finiſhed; by which means cracks are formed, and a miſcarriage enſues.

The excavation having received the intended form, its ſides are made firm and ſmooth, for the reception of the lime.

3. LIMING. The uſe of lime being merely that of preventing earth worms from perforating the coat of clay, the proper *quantity* depends, in ſome meaſure, on the nature of the ſoil. A fat rich earth, among which worms always abound, requires more than a dead hungry mold, or a dry ſtoney bottom; on which retentive pools are ſaid to have been made, without lime. However, as no ſoil, perhaps, is entirely free from thoſe enemies to ponds, it would be folly to riſque a miſcarriage, in any ſituation; as the expence of liming makes but a ſmall portion of the whole expence.

The only *preparation* of the lime is that of ſlaking it, and picking out the cores; no

ſifting

ſifting or ſkreening being, in general, uſed; though obviouſly uſeful.

It is uſually *laid on* with a ſpade or ſhovel; but a ſieve would, perhaps, be found, by the inexperienced, a better tool; and the extra labor no object.

The *thickneſs of the coat*, laid on, is about half an inch. Half a chaldron of lime is ſufficient to complete a pond of forty feet diameter. The principal part of it is laid on, beneath the clay; a few buſhels, only, being reſerved for ſcattering round the edges, to prevent the worms from getting *into* the clay *.

* A ſtill more ſecure, and, on the whole, a more eligible method of liming has lately been thought of, and is now (June 1787) in practice, at Lockton (in this neighbourhood), by the Commiſſioners of Incloſure, in making PUBLIC DRINKING POOLS, for the uſe of the townſhip. Inſtead of ſcattering the lime, in powder, it is formed, with ſand, into mortar; a regular coat of which is ſpread, about an inch thick, not only beneath, and at the edges of the clay, but over the entire ſurface. This is an obvious improvement, which appears, to human foreſight, to bring this method of forming pools near to perfection. The clay becomes caſed, on either ſide, with a regular coat of cement, and is thereby ſecured, in perhaps the completeſt manner poſſible, from the attack of worms. The labor and expence, however, is by this method increaſed. A pond, nineteen feet diameter, took two chaldrons and a half

4. CLAYING. In this operation, the manual art, and the labor, principally center.

Upon the Wolds, clay is ſometimes fetched ſix or ſeven miles; and is ſeldom found at hand, in ſituations where artificial pools are moſt wanted: the *carriage* of the clay, therefore, generally becomes a heavy article of expence.

The *choice* of clay is thought to be leſs eſſential, than the working of it. Good ponds are ſaid to have been made with common loamy mold; but it is wrong to depend on any thing, but a ſtrong ductile clay, if it can be had, within a moderate diſtance.

The *thickneſs of the coat*, now pretty generally laid on, is about five or ſix inches, in the rough; beating it down to about three inches. In the infancy of the art, two coats of clay, of about that thickneſs, were laid on; but one coat has been found effectual, and much leſs expenſive. However, it is probable, it will not prove ſo durable.

The

half of lime, and five ſmall cart loads of ſand. Both the materials were ſifted, and worked up, in the uſual way, into mortar. Great caution is neceſſary in laying on the clay, in this caſe. If the mortar do not lie ſome time to ſtiffen, the clay diſplaces it: if it get too dry before it be covered, it is liable to crack.

The *method of beating* will be difficult to deſcribe; yet it moſt eſpecially requires deſcription.

The *drier* the clay is worked, the leſs liable it will be to crack with drought, when finiſhed. In a dry ſeaſon, however, it is neceſſary to moiſten it: for which purpoſe the center of the pit is ſometimes finiſhed, firſt, to collect the water of ſhowers; the carriage of water being, in ſome caſes, expenſive.

In *laying on* the clay, the workmen begin at the bottom of the pit, and work upward; laying patch after patch, or circle after circle, until the brim be reached; taking great care not to carry on ſticks, ſtraws, dirt, or any kind of foulneſs, among the clay, or with their feet; and being careful not to diſplace the lime, in throwing it on: to prevent which the lime is not ſpread over the whole, at once; but is ſcattered on, as it is wanted to be covered with the clay.

A plot of clay laid on, and adjuſted, it is *beaten* flat, with a wooden "mell," or beetle, made, at preſent, of theſe dimenſions: the head fourteen inches long, and three inches diameter; the handle four feet long, and ſuited in thickneſs to the hand of the work-

man. Beetles of different ſizes have been in uſe, in different ſtages of the art; but none of them have been found to be ſo well adapted to the operation, as that in uſe at preſent.

The firſt operation is performed with the *ſide* of the beetle, to level the protuberances, and ſmooth the roughneſſes, ſo as to make the whole into a regular ſheet of an even thickneſs.

This effected, it is ſtruck, forcibly, with the *end* of the beetle, which is driven down nearly, but not quite, to the lime; leaving the ſurface full of ſomewhat honey-comb-like cells or dints. If the beetle be ſtruck, unguardedly, quite through to the lime, a piece of clay, and a little lime, if required, is carefully placed in the breach, to prevent a defect, in the part thus injured.'

The whole being gone over, in this manner, with the *end*, the ſurface is again levelled down, with the *ſide*, of the tool; the workman walking backward.

The next beating is with the *end*, but not quite ſo deep as before; and the roughneſſes being again levelled with the *ſide*, it is again worked over with the *end*; but ſtill ſhallower than in the middle beating.

The

The firſt ſtrokes with the *end* of the beetle ought to cloſe the bottom of the clay, firmly, with the lime and the bed on which it is ſpread;—the ſecond ought to unite the middle of the clay with the bottom;—and the laſt to cloſe, without a pore, the upper part with the middle;—and the laſt ſtrokes, with the *ſide* of the beetle, ought to be ſufficiently forcible to cloſe, entirely, the dimples formed by the laſt-given ſtrokes with the end.

If theſe ſeveral operations be thought inſufficient, it is continued to be worked with the end and ſide of the beetle, alternately, until not a flaw can be found; the entire coat of clay being manufactured into a lead-like ſheet, firm enough to bear a man without an impreſſion, and a horſe without injury *.

5. COVERING. The firſt coat is of common *earth*, to aſſiſt in keeping out the drought, and to make a bed for the ſtones; to prevent their aſperities from piercing, and

* When two coats of clay were in uſe, the upper one was laid upon the rough ſurface of the laſt end-beating; by which means the two coats became, by the ſubſequent beatings, incorporated in one thick ſheet. A ſubſtantial method, this, of which the preſent appears to be rather a refinement, than an improvement.

thereby injuring, the ſheet of clay. This coat may be three or four inches thick, according to the nature of the ſtones with which it is to be covered. If theſe be large and irregular, more earth is requiſite, than when the ſtones are ſmall, ſmooth, or flat. The leaneſt moſt infertile ſoil is fitteſt for this purpoſe. WORMS and WEEDS are equally to be feared; and a rich ſoil is genial to both. In this point of view, two coats of clay are much preferable to a coat of clay, and a coat of rich mold.

Pondmakers ſeem not to be ſufficiently aware of the miſchievouſneſs of WEEDS: indeed, ſome ponds will remain, for ſeveral years, in a manner free from them. But I have ſeen others, in which weeds, even docks (near the edge) have grown luxuriantly. It is probable that the tap-rooted weeds ſtrike through the ſeveral coats; and, whenever the roots decay, a perforation muſt be left.

Mold taken from a dry ſound highland ſituation is, in all human probability, leſs liable to propagate *aquatic* weeds, than the earth of a low ſituation or a bog *.

The

* I have obſerved an ingenious and ſimple method of keeping the weeds under; eſpecially at the edges, where they

The mold being rendered level and ſmooth, the *ſtones* are laid on: firſt covering the mold with the largeſt, laid with a flat ſide downward, to prevent their ſinking down to the clay; and upon theſe laying ſmaller, until the coat be made five or ſix inches thick *.

A PAVEMENT would be a more regular covering; and, if the ſtones were ſet in lime and ſand, would not only prevent *worms* from getting into the mold, and upper ſide of the clay, when the pond happened to be dry; but would, in all probability, prevent *weeds*; and, when the pond required to be *cleaned* from mud, would be a regular floor to work upon.

The only objection I have heard made to PAVING the bottoms of ponds, is, that it would be a temptation to cattle to go into

they are generally moſt abundant. Though all the ſides of a drinking pool be open, cattle will go to particular places to drink; and, in theſe places, the weeds are trampled upon and killed. Therefore, to check the rankeſt, the parts which are moſt free are covered with thorns, while thoſe which are weedy are left open, for the cattle to drink at.

* *Straw* has been uſed between the clay and the ſtones; and, in the inſtance (mentioned in a foregoing note) in which an improved method of liming was practiſed, a layer of thick *ſods* was laid, graſs-ſide downward, upon the lime; and, upon the ſods, about ſix inches thick of looſe ſtones.

the water, in hot weather; and, by ſtanding there, would not only foul the water, but in time tread up the pavement, and injure the clay; whereas ſharp looſe ſtones prevent their going farther than the edge. If the ſtones made uſe of in a pavement were ſufficiently large, the latter part of the objection would fall; and whether cattle ſtanding in a pool, in ſummer, be detrimental or beneficial, may be a diſputable point.

However, whether or not the inſide of the baſon ought to be paved, the rim ſhould certainly be a broad ſmooth cauſeway, with a gentle graſſy ſlope from it; eſpecially on the lower ſide; that the cattle may approach the water, without wading in dirt, to the injury of the bank; and without having ſharp looſe ſtones to walk and ſtand on, while drinking.

A drinking pool, formed by a ſkilful artiſt, full to the brim, free from weeds, and ſmooth round the edge, is, in a green paſture ground, as agreeable an object, as the eye can be entertained with.

6. SEASON OF MAKING. Autumn is eſteemed the beſt time. Drought and froſt are both enemies to new-made ponds. In autumn, drought has generally abated, and a ſufficiency

ſufficiency of rain water may be expected in this ſeaſon, to fill them before froſts ſet in. A covering of *ſtraw* over the ſtones is the uſual guard againſt the extremities of ſeaſons.

If a reſervoir be formed in a ſlope, where the lower ſide requires to be raiſed with looſe earth, it ought (as has been already intimated) to remain a conſiderable time to ſettle, before the coatings be put on: otherwiſe, it is liable to ſettle afterwards, and crack the clay. I have ſeen an inſtance of miſcarriage through this neglect. If there be much made earth requiſite to be raiſed, the excavation ought to be formed, twelve months before the claying be done.

7. EXPENCE. Although it is now twenty years ſince the diſcovery was made, the art is ſtill partially hid under the veil of myſtery; and is not yet become familiar to common farm laborers. In *this* neighbourhood, ponds ſtill continue to be made, by men from the Wolds; all of them, in reality or pretence, pupils of the firſt inventors.

Theſe men generally work by the groſs; the price being in proportion to the diameter: but they ſeem to have no regular method of calculation.

Ten

Ten pounds were given, and may now be conſidered as a medium price, for twenty yards diameter *; forming, claying, covering, and, generally, digging the clay, included: all carriage and extra labor being done by the employer.

A circle twenty yards in diameter contains in its area 314 ſquare yards. Therefore, each ſquare yard of *ſurface* coſts, at this price, ſevenpencehalfpenny.

The ſolid contents of a cone, whoſe baſe is 60 feet diameter, and whoſe height is ſix feet, is 209.4 cubical yards; each of which coſts, in the above inſtance, eleyenpence-halfpenny.

Five pounds have been given for a pond, twelve yards in diameter: which is tenpence-halfpenny, each ſquare yard of ſurface; and, ſuppoſing it four feet deep, two ſhillings each cubical yard of water.

Three guineas were given for forty feet diameter, and four feet deep, the excavation having been previouſly formed. This may be called four pounds for the groſs; which is

* In the early days of the art, and when two coats of clay were uſed, twenty pounds were given for ponds of this dimenſion.

is about ſevenpence a ſquare yard of ſurface; or fifteenpencehalfpenny, each cubical yard of water.

The men, in the laſt caſe, earned about three ſhillings and ſixpence a day, without extraordinary exertion. In the firſt mentioned inſtance, the ſame workmen did not (according to their own aſſertion) make more than two ſhillings and ſixpence, a day. But a large pond gives longer employment; and the buſineſs of pondmaking being uncertain and inconſtant, travelling workmen can afford to make a large pond at a cheaper rate, than a ſmall one.

The *curve ſuperficies*, or ſuperficial contents of the *ſides*, of a cone twenty yards in diameter at the baſe, and two yards high, is about 320 ſquare yards. This, in making a pond of thoſe dimenſions, is *the quantity of coating*: for each yard of which near 7½*d.* was given in the firſt inſtance, and leſs than 7*d.* in the laſt. *Sixpence each ſquare yard of ſurface* to be *coated, may perhaps be taken as a fair mediùm price*.

To aſcertain the quantity of coating, *to be done*, meaſure the exact circumference or rim of the pit, when finally formed and adjuſted for claying: this dimenſion multiplied by half the

the length (or depth) of the ſide (meaſuring from the brink, down the ſlope, to the center) is the quantity of ſurface *to be* clayed and coated. The digging would (under this mode of calculation) fall proportionally heavier, on a large pond, than on a ſmall one; but this would be counterbalanced by the advantage abovementioned.

The quantity of clay uſed, in the firſt inſtance, was about forty cart loads, fetched about three miles; in the laſt, about fifteen loads, fetched one mile. The quantity of lime, in the former caſe, one chaldron; in the latter, half a chaldron.

From the ſum of theſe particulars, it is plain, that the larger the pond, the leſs, in proportion, is the expence. A reſervoir, to contain two hundred cubical yards of water, requires little more than three hundred ſquare yards of coating; whereas one, to contain only fifty yards of water, would require one hundred and twenty yards of coating: conſequently, a cubical yard, of the former, would only coſt (at ninepence a yard for manual labor, materials, and carriage) eighteenpence; while the ſame quantity, of the latter, would coſt near two ſhillings and ſixpence.

The UTILITY of Drinking Pools requires

not

not to be dwelt on: but the SUPERIORITY of pools, made in the manner above deſcribed, to thoſe which have formerly been made, by ſome other art, or which have been formed by nature or accident, may with propriety be mentioned. During the dry ſeaſons which have prevailed of late years, it has been obſerved, that newly made ponds retain a ſupply of water, when the waters of other ſtagnant drinking places are dried up. This can only be accounted for, perhaps, by their perfect retentiveneſs, and by their being free from weeds, which convert to their own nouriſhment, and throw off daily by perſpiration, a great quantity of water. Upon the Wolds their excellence was moſt conſpicuous:— while one man was driving his ſtock, three or four miles to water, his neighbours, who had "made ponds" upon their farms, were free from this ſerious inconveniency. In many ſituations, artificial Drinking Pools may repay the expence of making, the firſt dry ſeaſon. Driving ſtock to diſtant water, in hot weather, and in a buſy ſeaſon, is an expence, and a detriment to the ſtock ſo driven, which it would be difficult to eſtimate.

GENERAL OBSERVATIONS. — On examining ponds, in this neighbourhood, which have

have been made ſome years, the evil effect of *covering with looſe ſtones* is evident.

For one, two, three, or more yards round their edges, according to the time they have been made, the uſe they have been liable to, and to the ſteepneſs of their ſides,—the ſtones are entirely diſplaced, or trodden into the clay; which is, by this means, expoſed to the feet of cattle, and to the open attack of drought and worms. For a while, the clay, even thus expoſed, preſerves its retentiveneſs; but, in time, it is deſtroyed, and the moſt valuable part of the pond entirely loſt.

This effect is ſo *probable*, ſo evident to be foreſeen, that, on firſt reflection, it ſeems aſtoniſhing ſo unſuitable a covering ſhould be univerſally adopted. A cattle, when it goes into a drinking pit, neceſſarily throws the chief part of its weight upon its fore feet; which, in the act of drinking moſt eſpecially, are placed, as for the intention of forcing, whatever they ſtand on, down the ſlope, toward the bottom of the pit. Upon looſe ſtones, laid on a ſteep ſurface, cattle cannot make a ſtep, or move a foot, without producing this effect, in a greater or leſs degree; and, by repetition and length of time, the entire coat (except ſome few which happen

to

to be trodden into the clay) muſt, in the nature of things, be forced into the center.

But this practice, evidently abſurd as it undoubtedly is, in *this* Diſtrict, was firſt eſtabliſhed upon the *Wolds*, whoſe *ſtone* is of a periſhable nature; a ſpecies of *chalk*; which, on being expoſed to air and water, and to the treading of cattle, unites into a cement; which, forming a regular caſing, preſerves the clay from injury, for a conſiderable length of time. *Looſe chalk* as a covering was, therefore, a good thought of the firſt inventors (indeed upon the Wolds there was no alternative); and it is not to be wondered at, that their pupils, moſtly day laborers, ſhould imitate the practice, in this country, by making uſe of *looſe ſtones*.

Periſhable or *ſoft ſtones* of any ſpecies, a ſtrong rough *gravel*, or even *ſand*, would, I believe, be better than looſe hard unperiſhable ſtones.

But, in this neighbourhood, where ſtones of various kinds abound; or, in any country, where ſtones of a proper ſize can be procured, at a moderate expence; there appears, to me, to be no choice, with reſpect to covering. A regular FIRM PAVEMENT, ſtrong enough to bear ſtock without an impreſſion, would

would laſt through ages; and although the expence, in the firſt inſtance, would be ſomething more than that of looſe ſtones, its durability would, in the end, doubly repay it. Even the Wold ponds, which have been made, fifteen or twenty years, are many of them beginning to fail, and will, in a few years more, require to be freſh coated: whereas, a pond properly paved would, in all human probability, remain perfect, for at leaſt a century.

There would be an advantage of a PAVED pond, which may not ſtrike every one. The clay and its coverings, while the pond is filled with *air*, appear to be a firm ſolid maſs, which would require a great power to diſturb it. But the pond being filled with *water*, the texture of the clay is changed, and the relative gravity of all the covering materials conſiderably altered. They no longer adhere to the bottom with the ſame firmneſs, nor, in fact, lie upon it with the ſame weight, they did before the water was let in. For if, inſtead of ſtone, the clay had been covered with blocks of wood (for inſtance), whoſe ſpecific gravity was leſs than that of water, they would have riſen to the ſurface, and have left the clay wholly expoſed: even

ſtones

ſtones themſelves lie, in water, with little more than half their weight, in air.

This propenſity in the covering materials, when covered with water, to riſe towards the ſurface, and the ſtate of ſoftneſs which the clay is reduced to, by a free communication with the water, render them very liable to be diſturbed by the feet of cattle; while ſubterraneous water, after heavy rains, may inſinuate itſelf beneath the clay, and not only diſturb the lime, but raiſe up the clay, and aſſiſt in rendering the coatings ſtill leſs firm; or, in other words, in promoting the general tendency of the whole, to form an artificial quickſand, or quagmire.

But if a pond were properly PAVED, while the coats were yet in a firm ſolid ſtate, the pavement, being an inverted dome, and acting as an *arch* againſt their upward tendency, would preſerve them, in that ſtate, ſo long as the arch itſelf ſhould remain perfect; which would, of neceſſity, be until the ſtones were worn out, or the foundation on which they reſted ſhould give way. For the preſſure of the feet of the cattle being directed towards the center, would rather *ſtiffen* than weaken the *arch* *; while the ſwelling

* Hence, the ſteeper the ſides of the Pool, the *ſtronger* the pavement.

of the clay and the ſoil (if any), with the water which would of courſe filter through the pavement, would aſſiſt in promoting the general union.

If irregular rough pebbles were uſed, the flatteſt ends ſhould be placed downward, to prevent their injuring the clay, and the points upward, to prevent the cattle from ſliding into the pond while drinking; as well as to prevent their ſtanding upon them, after their thirſt were quenched.

But ſtones hammered into a long-cubical form, like the Scotch ſtones now uſed in paving the ſtreets of London, would make the firmeſt pavement; their upper edges or ends being left rough, for the purpoſes laſt mentioned.

It appears to me, that a well made pond, paved in the workmanlike manner, in which the ſtreets of the metropolis are now in general paved, muſt of neceſſity remain perfect, until an eruption of the earth, or a general diſſolution take place: provided the rim were, from time to time, repaired, to prevent the feet of cattle from breaking up the edge of the baſon.

II. MADE RILLS. The heights of the northern margin have neither ſprings nor rivulets (ſome very few inſtances excepted), nor

nor any other *natural* waters, than the brooks which wind at the bottoms of the deep vallies, that divide them; and the rivulets which generally run at the feet of the precipices, that terminate them.

Formerly, theſe brooks and rivulets were the only reſources which the villages, that are ſcattered on theſe heights, had for water, both for the uſe of cattle, and for domeſtic purpoſes.

In proceſs of time, wells were ſunk; but they are of ſuch a depth, as to make the labor of raiſing the water, little leſs than that of fetching it, from a moderate diſtance.

This kind of natural neceſſity has led to an expedient, which, though not new in principle, is perhaps entirely ſo in ſimplicity of execution, and might be practiſed with great advantage, in many ſimilar ſituations *.

The moreland mountains riſe generally with an eaſy aſcent, from the beds of the rivulets laſt mentioned, to a height much exceeding that of the hills to be watered; and frequently abound with ſprings, almoſt to their higheſt ſwells.

* 1796. This was written, before I had ſeen the "potwater leats" of Devonſhire. See WEST OF ENGLAND, art. FARMERIES.

Theſe ſprings are collected, and conducted by a narrow channel, down the ſlope of the mountain ſides, and along the face of the precipice, until the ſummit be gained; the waters being thence conveyed to the place or places deſired.

In PLANNING an artificial rill, a level, and ſome little knowledge of the country, are the requiſite guides. The ſurveyor begins at the place to which water is required to be brought; and aſcertains the loweſt part of the brink of the precipice, from which water can be conducted. The face of the precipice is traced in like manner; and, if neceſſary, the aſcent of the moreland hills; until ſprings, or their natural rills, can be commanded.

If his level bring him to the bottom of the ſteep, ſoon enough to catch the rivulet which runs at its foot, the work is readily completed. If not, he goes above its higheſt bend; generally to the head or higheſt part of the valley (between the heights and the morelands) and winds along the ſide of the oppoſite ſwell, to ſome more elevated ſource.

If, when he arrive on the moreland hills (or by an obſervation from the top of the precipice) he find that nature does not furniſh the

the requiſite quantity of water, high enough to give the neceſſary fall, the intention is of courſe fruſtrated.

In EXECUTING an artificial rill, opening a ſhallow channel, of a width proportioned to the quantity of water to be conducted, is the principal operation. In making *ſtagnant pools*, we have found, that much art is neceſſary to make them retentive; but, in forming the bed of a rill, no ſuch art is requiſite. It is the nature of *running waters* to render the ſurface, on which they run, firm and retentive. *Sand* is, I believe, the chief material uſed in forming the channels of theſe rills; and this only in places, where an open rock, or other porous ſtratum, is croſſed.

Much, however, depends on the quantity of *fall*, and the quantity of water. If the fall be but little, and the quantity of water, at the ſource, be ſuch as not to admit of much waſte, great care is requiſite, in forming the bed of the rill.

The FALL is regulated, in a great degree, by the quality of the *ground*. On good ground, the channel is nearly level. Over faulty ground, the water runs with a current; for the double purpoſe of getting quickly

over it, and rendering its channel the more retentive.

The principal ENEMIES of artificial rills are leaves, in autumn, and ſnows, in winter. To remove the obſtructions, which theſe not unfrequently cauſe, and to repair ſuch breaches, as time will always make in the works of art, a *ſuperintendant* is neceſſary to every artificial rill.

THE RILL OF KIRBYMOORSIDE is, I believe, the largeſt, and was the firſt, which was brought upon theſe Heights*. Since the introduction of this, ſeveral others have been raiſed; and ſome few unſucceſsful attempts have been made: the channel was, in one inſtance (that of *Newton*) extended a conſiderable way before the impracticability of completing it, at a moderate expence, was diſcovered; a piece of miſconduct which nothing but a want of accuracy, in the uſe of the level, can lead to †.

The

* This rill was brought to the villages of Gillimore and Fadmore, near forty years ago; and has been extended to Kirby, about thirty years,—by JOSEPH FORD; a ſelf-taught engineer, of great ingenuity and ſome judgment; a man to whom the country *owes* much.

† The miſcarriage, in this caſe, was not owing to a want of elevation in the ſource, but to a depreſſion of the channel

The *firſt coſt* of the Kirby rill was not, altogether, one hundred pounds. The *diſtance*, about ten miles: watering (beſides the town of Kirby) two villages, and a line of cultivated waterleſs upland country, about four miles in length.

Beſides the firſt coſt, which was raiſed by ſubſcription, a SUPERINTENDANT has ten pounds, ayear, for keeping it in repair, and free from obſtructions; which yearly ſalary is paid by the voluntary contribution of the perſons benefited; each being rated agreeably to the eſtimated benefit received *.

channel at the foot of the ſteep; the head of the valley (if ſuch it may be called) being lower than the top of the precipice, at the given point. This ſhews the neceſſity of tracing the entire channel, with ſufficient accuracy, before any other expence be incurred.

In the caſe of Kirby, the channel is raiſed, ſome feet, by a bridge-like mound of earth, thrown acroſs the crown of the valley.

The ſame mound ſerves the purpoſe of conducting another rill, acroſs the ſame difficult paſs; from whence the Kirby rill takes an eaſtward, the rill of *Wellburn* (applied principally to the watering of paſture grounds) a weſtward direction.

* In a bill, which is now before Parliament, for incloſing the commons and remnant common fields of the townſhip, a clauſe is wiſely inſerted to eſtabliſh a *legal aſſeſſment* for the preſervation of this rill.

III. FIELD WELLS. The ſkirts of the margin, formerly arable fields, but now graſsland incloſures, were, on their being incloſed, equally deſtitute of natural and artificial watering places. Water for ſtock, however, was in a degree neceſſary; but the art of pondmaking was not then known, Wells were therefore ſunk: the depth, twenty to thirty feet, according to ſituation. The water is raiſed, either by a pump or by a roller and bucket. The receptacles, ſtone troughs. Sometimes the well is ſunk in the line of a fence, ſupplying two fields with water.

In ſituations which are low and flat, yet dry, pools are difficult to be filled; and wells of courſe more eligible. They are readily ſunk, and ſeldom dry, in ſuch ſituations.

6.

ROADS.

THE SPIRIT of improvement has, in no particular, made greater exertions, than in the FORMING OF ROADS. Within my own remembrance, all the roads of the Diſtrict lay

lay in their *natural* form; that is, in a ſtate of flatneſs, in flat ſituations; or in hollow ways, on the acclivities of hills. Now there is ſcarcely a flat road, or a hollow way, left in the country. The more public roads, at leaſt, are now univerſally *barrelled*; the banks of the hollow ways having been thrown down, and the flat roads raiſed into a CONVEX FORM.

Formerly, the ſloughs and inequalities were filled up, with a ſoft ſort of gravel; which, being ſoon reduced, or ſinking in the mire, on which it was laid, only added to the quantity of dirt, and the heavineſs of the road. Now, the univerſal COVERING, on this ſide of the Vale, is LIMESTONE, broken into ſmall pieces, affording a rough but durable road.

But notwithſtanding theſe exertions, and the quantity of labor and money which have been expended on theſe alterations, the roads are ſtill far from being commodious, or even ſafe. The ſame folly of *doing over much*, which diſcovers itſelf, too plainly, in the roads of almoſt every Diſtrict of the kingdom, is here manifeſt.

Roads can ſcarcely be *raiſed* too little: a *gentle deſcent* for rain water is all that is requiſite

requiſite or uſeful, and conſtitutes the ſole intention of raiſing them. And the only *drain*, the ſide of a road requires, is a mere channel, with outlets, to prevent the water, thrown off by the road, from collecting by the ſide of it.

Therefore, IN FORMING A ROAD, all the preparation requiſite (previous to the covering) is to form ſuch a channel, on either ſide, by paring down the *outer edges* of the *ſite*; caſting the ſoil upon the margin, or carrying it off, for ſome uſeful purpoſe. Not a ſpade-full of earth ſhould be thrown into the middle of the ſite, except to level inequalities. The *convexity* (the ſlope formed by the paring on either ſide excepted) ſhould be given, entirely, by the ſtones or other hard materials; which ought to be laid on a *firm ſurface*. If the ſite be naturally unſound, the ſoil ought to be removed, or to be made firm by under-draining. For until a FIRM FOUNDATION be obtained, it is highly imprudent to be at the expence of laying on a covering.

Nevertheleſs, a general method of RAISING ROADS, in this and almoſt every other recluſe Diſtrict, is to dig a *deep ditch* on either ſide; to caſt the looſe earth into the *middle of the ſite*; and, on this, to pile a *narrow high*

high ridge of hard materials. The effect is, carriages being neceſſarily confined to one track upon the ridge of the road, the materials, which are not preſſed into the looſe dirt beneath, are ſoon cut through, by the wheels of carriages always paſſing in the ſame ruts;—through which, the artificial bog, below, riſes to the ſurface.

The method of REPAIRING is equally erroneous. Inſtead of the ruts being cloſed, by pecking in the ridges on either ſide of them, or by filling them with a *few* additional ſtones; the entire road is covered with a *thick coat:* and ſo often as freſh ruts are formed, ſo often is this expenſive, and therefore doubly abſurd, method of repairing repeated; until having laid coat over coat, and piled ton upon ton, unneceſſarily, a mound of earth and ſtones, reſembling the roof of a houſe, rather than a road, is formed.

The FORMING and REPAIRING of ROADS incur a heavy tax, on landed property; and the SAFETY of roads is a matter of public concern.

Some years ago, the Legiſlature paid conſiderable attention to this ſubject, and extended their authority, perhaps, as far as could be done, with propriety.

It

It might be difficult, perhaps, to frame a *general law*, for the FORMING of Roads; becauſe different ſituations require different FORMS. In low ſituations, a common drain, or a ditch, by the ſide of a road may be neceſſary; but, in abſorbent upland ſituations, neither of them are admiſſible: the road ought to fall, gently, to THE FOOT OF THE HEDGEBANK, on either ſide, when it leads through a lane of a ſuitable width; or, to THE FOOT OF A MOUND OF EARTH, raiſed (with the parings of the road) for the purpoſe, when the lane is too wide, or the road paſſes over an open country. In low retentive ſituations, where deep DRAINS are requiſite, ſimilar mounds ought to be formed, as GUARDS to the SHORES or DITCHES *behind* them; openings being made, at proper diſtances, for the paſſage of the water collected by the road.

The CONVEXITY of a road ought to be ſuch as will throw off the rain water, which falls on it, without endangering, in any degree, a *top load*.

Before a TOP-HEAVY LOAD can be *overturned*, the entire weight muſt be thrown upon the wheel or wheels of one ſide; conſequently, the nearer it approaches to the

dangerous

dangerous equipoiſe, the greater injury the road will receive.

Thus, ſuppoſe a loaded waggon to weigh two tons. Upon level ground, each wheel would ſuſtain half a ton; but, upon a ſhelving road, ſteep enough to bring the load to the equipoiſe of overturning, the entire weight would reſt upon two wheels, only; each of which would, in this caſe, ſuſtain one ton; conſequently, if we reckon preſſure as injury, the damage done by a carriage, at the point of overturning, is twice as much, as that which is cauſed, by the ſame carriage, on level ground; and the nearer it approaches to one or the other of theſe extremities, the more or leſs injury the road will ſuſtain by it.

Nor is the injury, the road itſelf is ſubjected to, the only evil effect of a ſteep-ſided road. The ADDITIONAL FRICTION which is thereby cauſed, between the inner naves of the wheel and the body of the carriage, &c. (or between the iron work which ſeverally belongs to them) gives an addition of *reſiſtance to the team*; whoſe extraordinary exertion, on this account, is at once injurious to themſelves, and to the road.

Moſt of the ROADS about the METROPOLIS, and many parts of the GREAT NORTH

ROAD

ROAD between Gunnerby Hill, in Lincolnſhire, and Ferrybridge, in Yorkſhire, are, for road ſurveyors, proper ſubjects of ſtudy.

The ſurveyors of roads, in general, are as uninformed, or as inattentive, about the REPAIRING of roads, as they are about the forming of them.

RUTS are the principal enemies of a *barrelled* road. On a *waved* road they ſerve as conductors to convey off the water: but, on a *convex* road, the deſcent of the water ought to be, immediately, from the crown to the channels on either ſide.

The great art, therefore, in the MANAGEMENT of CONVEX ROADS, is to form them, in ſuch a manner, as to *prevent ruts*, as much as poſſible; and, if they appear, to be attentive in *doing them away*, before any material injury take place.

The obvious method of PREVENTING RUTS is to keep the road low, at the crown, and guarded, at the edges; ſo that even top loads may be drawn over *every part*, with conveniency and ſafety.

Upon the roads above ſpecified, it would be difficult to endanger the moſt top-heavy load; except by running wilfully upon the hedgebanks. *Every foot*, from ſide to ſide,

is

is travelable road; and every part impartially travelled over.

On the contrary, upon the roof-like roads, of this and other countries, the driver of a top-heavy load *dare* not leave the top of the ridge; and the drivers of loads which lie lower, for a variety of reaſons, follow the beaten track: even horſemen, who are timorous, are *afraid* to leave it; and thoſe who are not ſo, purſue it for obvious reaſons; no other part of the road being beaten, or convenient to travel upon.

Of a road, properly formed, the immediate channel on either ſide (being a ſpecies of *waſhway*) is frequently the cleaneſt, firmeſt, and, if freed from ſtones and other obſtructions, the pleaſanteſt HORSE PATH. But who, poſſeſſed of common prudence, would ride upon the tender brink of an unguarded ditch?

The effect is notorious: horſes, and carriages of every kind, are equally confined to the ſame narrow track, upon the ridge; frequently conſiſting of two ruts and a middle path, with no better *quatering*, for horſes which draw double, than there is in a narrow by lane, or over a rutty common.

The

The method of KEEPING CONVEX ROADS IN REPAIR is *not* to permit them to be worn into ruts and holes, until they be impaſſable, and then to load the whole ſurface, ſound or unſound, with a thick coat of materials; but to pay, from time to time, due attention to the wearing of them.

Ruts and hollows, which are yet too ſhallow to require to be filled in, ſhould be opened, on the lower ſide, to prevent water from ſtanding in them; but thoſe, which are too deep for this operation, ſhould be levelled in, without loſs of time.

Upon *ſtone roads*, this may frequently be done, by *collecting looſe ſtones*, and chipping off the neighbouring *protuberances* (equally *dangerous* on the ſurface of a road) and burying them in the hollows to be filled up; thus removing two principal evils of ſtone roads, in doing away a third.

But additional materials being, in many caſes, requiſite, they ought to be laid ready in proper receſſes; for the purpoſe of levelling inequalities, as faſt as they are made; and thereby preventing the evil effects of the worſt enemy of a well formed road,—*ſtanding water*.

The

The road between Lynn and Wiſbech, over the marſhlands of Norfolk, is formed entirely of *ſilt*, a ſpecies of ſea mud, ſo fine as to be ſcarcely palpable; nevertheleſs, with the precautions of *keeping the ſurface free from ſtanding water*, and of *levelling in the ruts and hollows*, with a hoe, *ſo faſt as they are formed*, it is, in wet weather, one of the fineſt roads in the kingdom.

I have obſerved, in other parts of the iſland, roads, covered with nothing but common *ſand*, kept in good condition, by the ſame eaſy means. And the roads, which have been held out as patterns, are all managed, whether of *gravel* or of *ſtone*, in a ſimilar way.

Indeed, all well managed TURNPIKE ROADS have men *conſtantly employed* upon them, for the purpoſe of *repairing ſmall breaches, in order to prevent large ones*; and every TOWNSHIP ought to employ a ROADMAN, or WORKING WAY-REAVE, one or more days, in each week, throughout the year, for the ſame excellent purpoſe.

Inſtead of exhauſting the whole of the ſtatute duty (as it is called) in laying on coat upon coat, at ſome certain ſeaſon of the year, and letting the roads lie until the return of

that ſeaſon, as much neglected as if they did not belong to the townſhip;—ſuch parts, only, as are worn too thin, ſhould be covered: a ſufficiency of materials being reſerved, and diſtributed in the moſt convenient manner, for repairing occaſional breaches.

Before I cloſe this ſection, two particulars require to be ſpoken to:

The width of roads; and

The height of hedges on the ſides of roads.

The Road Acts, paſſed in the thirteenth year of the preſent reign, order, that every "horſe or driftway" ſhall be made eight feet *broad*; and every "cartway" leading to a market town, ſhall be twenty feet *broad*; that the *lane* of every "highway" ſhall be thirty; and the *lane* of every "turnpike road" ſhall be ſixty feet *wide*; without ſpecifying any particular BREADTH OF TRAVELABLE ROAD.

In ſome few ſituations, as in the bottom of a narrow valley, between two hanging woods, and where a ditch and a mound of earth are requiſite on either ſide of the *road*, a *lane*, ſixty feet in width, may be, in ſome degree, neceſſary. But, in ordinary ſituations, that width incurs a *waſte of land*, without any adequate advantage. Indeed, upon ele-

vated

vated heights, and in other expoſed ſituations, the traveller is thereby deprived of the *ſhelter*, which is required, and which a cloſer lane would afford.

Nor does the loſs of culturable land, and the circumſtance of expoſing travellers unneceſſarily to the inclemency of the weather, conſtitute, in this and other caſes of a ſimilar nature, the ſum of impropriety; *graſſy lanes* are the greateſt nuiſance an occupier of land can have in his neighbourhood: and it would be well if ſome *general law* could be inſtituted, for their regulation.

In the laſt ſection, it was mentioned, that in the Sinnington *Incloſure Bill*, an admirable clauſe is inſerted, reſpecting the graſs of the roads to be ſet out. For the firſt ten years, no ſtock whatever are to be *turned looſe* into them; nor, after that time, are they to be *common*; the ſurveyors, for the time being, having a power to *let* them, and *apply the rent to the repair of the roads of the townſhip*.

With reſpect to the drying of roads, after rain, more depends on the HEIGHT OF THE HEDGES, than on the width of the lane. The crown of a barrelled road, thirty feet wide, with hedges kept down to four feet high, will dry, nearly as ſoon, as if no hedges were

near it, and much ſooner, than a road in the middle of a lane, ſixty feet wide, with hedges and perhaps a line of coppice wood, as may frequently be ſeen, thirty or forty feet high, riſing on each ſide of it; depriving the road entirely (unleſs when the wind happens to blow lengthway of the lane) of a free communication of air.

In low, and indeed in ordinary ſituations, high hedges, on the ſides of roads, are doubly hurtful: they are not only injurious to the road itſelf, but, in cloſe weather, are offenſive to the traveller, and very injurious to the beaſts of burden and draught, which are employed upon them. The Highway Act therefore wiſely orders, "that the poſſeſſors "of the land next adjoining to every highway "ſhall cut, prune, and plaſh their hedges."

But this ſalutary clauſe has, hitherto, been very little attended to. In many counties, it would be difficult to find an inſtance, in which it has been obeyed, or enforced.

The magiſtracy of this county, however, may claim ſuperior merit, in this reſpect. The road between York and Doncaſter, near forty miles, is ſingularly well kept in this particular ſcarcely one licentious buſh

is

is left: and many of the leſs public roads of the county are laid open in a ſimilar manner.

But excellent as this regulation undoubtedly is, in low as well as in ordinary ſituations, — more eſpecially where roads lead through old incloſed countries, in which lanes are frequently too narrow,—it would, if indiſcriminately enforced, be greatly detrimental, in wide lanes and expoſed ſituations; where *ſhelter*, rather than a current of air, is deſirable,

However, the execution of this law being in the hands of magiſtracy, its evil tendency may be eaſily checked, without injuring the more general intention.

7.

SHORES* AND EMBANKMENTS.

THE DIVERSITY of country, which the Diſtrict under ſurvey exhibits, requires

 a varied

* SHORES. This term has been criticiſed, through a want of its import being ſufficiently attended to. It comprizes not only SEWERS and other ARTIFICIAL SURFACE

a varied exertion of art, with reſpect to SURFACE WATER. Upon the hills, art is required, to *retain* it upon the ſurface; in the lower parts of the Vale, art is equally wanted, to *haſten* it to the river, or general outlet.

It has been already mentioned, that much of the bottom of the Vale is, by natural ſituation, liable to be overflowed by the rivers in times of flood. Nevertheleſs, every part of it, I apprehend, is ſo ſituated as to be capable of being laid ſufficiently dry, by the rivers at dead water.

Therefore, the only exertion of art, in this caſe requiſite, is, to open ſufficient SHORES from the rivers to the grounds to be laid dry; ſinking ſufficient DITCHES, from the ſhores; and ſufficient DRAINS, from the ditches.

Many

FACE DRAINS, but every NATURAL CONDUCTOR and RECEIVER of SURFACE WATERS. It is here uſed, as a GENERAL TERM, which is neceſſary in a work of this nature. It includes every Paſſage, Outlet, or Vent, that aſſiſts in freeing the SURFACE of the ſoil from collected water: whether it be a Kennel or Strand,—a made Ditch or Sewer,—a Rivulet, Brook, or River of whatever magnitude,—or the Sea itſelf.

See the words SEWER and STRAND, in the PROVINCIALISMS. (1796.)

Many efforts, of this nature, have been made, with ſpirit and with ſucceſs. The WEST MARSHES, in general, are a ſtriking inſtance: for although they lie upon a flat, and but barely above the level of the waters of the Derwent, they are, at preſent, kept principally in an arable ſtate, and chiefly in wide flat beds. Nevertheleſs, by keeping open furrows, deep ditches, and clean ſhores, the land, in general, is left as free from ſuperfluous moiſture, as if it were elevated a mile above the Derwent.

But the EAST MARSHES (and ſome other ſmaller portions of the Vale) ſtill remain a diſgrace to the country; lying, chiefly, in a ſtate of *fenn*—provincially "Carr;"—overrun with ſedges and other paluſtrian plants; which afford, during a few months in ſummer, a kind of ordinary paſturage to young ſtock. In the winter months, they are generally buried under water, and, in the ſummer months, are ſubject to be overflowed.

The remedy, in this caſe, (and in other caſes of a ſimilar nature,—of which almoſt every Diſtrict in the kingdom affords an inſtance) is, TO BANK OUT THE RIVER, which winds through the middle of it; and, in

doing this, TO SINK A COMMON SHORE, ON THE OUTER SIDE OF EACH EMBANKMENT.

If, at the lower end of theſe SHORES, the RIVER lies *ſufficiently low*, at the time of dead water, to receive, freely, the drainage of the marſh, the work may be completed, at an inconſiderable expenditure, compared with the magnitude of an improvement of this nature. FLOOD GATES, placed at the outlets, to give vent to the ſurface waters, collected within the ſite of improvement, and to prevent the waters of the river, in times of floods, from flowing back upon it—are the only additional requiſites.

If the ſurface of the *river*, at dead water, ſhould be found to lie *too high*, for the neceſſary depth of the *ſhore*, MARSH MILLS *, placed in the lower parts of the ſite, will, in any ordinary caſe, do away the deficiency of fall.

The expence of a MILL is, in the firſt inſtance, conſiderable; beſides an annual expence of repairs, and attendance. But ſuppoſing the firſt coſt to be one or even two hundred pounds, and the repairs and attendance to be ten or even twenty pounds, a year, the whole expence would be inconſiderable, when

* See NORF. ECON. MIN. 118.

when compared with the improvement of converting, perhaps, two or three thouſand acres of *unproductive fenny grounds*, into ARABLE, MEADOW, and PASTURE LANDS, of *five*, or perhaps *ten times its value*.

In the caſe immediately under notice, mills, if requiſite, could be effective on one ſide of the river only. The RIVULETS and BROOKS, on the north ſide of the Derwent, are too copious to be diſcharged by a mill. But, by embanking thoſe rivulets, and by furniſhing each compartment of the marſh with a mill, the deſired improvement might, on a certainty, be made. On the ſouth and eaſt ſide of the Derwent, leſs difficulty would ariſe: the embankment of one rivulet, perhaps, would be found the only addition requiſite to the general improvement *.

It may be unneceſſary to ſay, that the excavated mold of the SHORES ought to go towards raiſing the BANKMENTS; thus obtaining, in one operation, the two principal means of improvement: or that *main ditches* ought

* Since writing this article, a meeting of the proprietors of theſe marſhes has been held, to conſider of an application to Parliament, for *ſtraightening and enlarging the bed of the Derwent!* But the propoſal was over-ruled.

ought to be led from the ſhore, into the area of the ſite to be improved.

One thing, however, may not be ſo obvious: namely, the SITUATION OF THE BANKS, WITH RESPECT TO THE RIVER.

If the BANKS be ſet upon the *immediate brink*, as in general they are, they become liable to be injured, by the ſmalleſt *deviation* of the RIVER. Beſides, the waters of floods being, by this means, confined (ſuppoſing a bankment on either ſide) merely to the bed of the river, the banks require to be raiſed to an unneceſſary *height*.

But if the lines of embankment be run at a proper *diſtance from the river*, as ten, twenty, or thirty yards, the BANKS are placed out of the way of danger, from the RIVER; and a greater area being left for the waters of floods to ſpread over, their riſe will be proportionably leſs, and the requiſite *height* of bank will of courſe be leſſened, in the ſame proportion.

Theory may conceive a *waſte of land* by this means; but experience ſhews, that ſuch an apprehenſion is ill grounded. The embankment is equally beneficial to the land it encloſes, and to that it ſhuts out from the river. The enriched waters of floods, now confined

confined by the banks, depoſit, on the incloſed ſlips, the particles which, hitherto, they had ſcattered over an extent of country. By this means the ſwamps, and hollows of the ſlips, are preſently filled up; and, in time, the entire ſurface is raiſed.

I have obſerved an inſtance of this kind, in which the ground, on the river ſide of the bank, has been raiſed, near a foot, above the natural level of the ground, on the other ſide of it.

By this elevation of ſurface, the land is not only laid dry, but, if the waters be of a good quality, is at the ſame time enriched.

Theſe ſlips, if of ſufficient width, are ſingularly well adapted to the purpoſe of OZIER BEDS: and are eligible PASTURE GROUNDS. The banks are places of ſafety, for ſtock to fly to, in floods; a ſpecies of refuge they had not, when the whole lay open.

The EXPENCE of embankment, in ordinary caſes, and under proper management, is far from exceſſive.

This Vale affords more than one inſtance of RIVER EMBANKMENTS. *Brawby moor*, containing about three hundred acres of low marſhland ſoil, over run, in an open ſtate, with furze and ruſhes, together with ſome inter-

interſpaces of ſedgey graſs, was liable to be overflowed by the river Seven, which runs on the *upper* ſide of it; the Rye, which waſhes it on the other ſide, being its natural ſhore.

Theſe three hundred acres are the entire property of the EARL OF SALISBURY; and, in their open ſtate, were let out in one hundred gaits, for young ſtock, at ten ſhillings each gait, producing his lordſhip, in that ſtate, fifty pounds a year.

The embankment coſt about ſixty pounds; namely, about three quarters of a mile, at one ſhilling a yard. But the ruins of an old bank leſſened the expence, in this caſe.

The bank, when finiſhed, was about ſeven feet high; wide enough, on the top, for cattle to walk upon; ſloped ſufficiently to prevent its ſhooting, or being trodden down by cattle; and faced with green ſods, to guard againſt the floods.

This improvement is worth tracing. Beſides the embankment, which, if the old bank had not aſſiſted, might have coſt one hundred pounds, a road, through the middle of the ſite of improvement, was requiſite to be formed;—the whole to be incloſed; and ſome erections to be made. Suppoſe the road,

road, the incloſure, and the buildings to coſt three hundred pounds, the whole expence would amount to four hundred pounds, or fifteen to twenty pounds, a year.

The rent, in the firſt inſtance, was, I believe, fixed at eight ſhillings an acre. Three hundred acres, at eight ſhillings, produce one hundred and twenty pounds a year; ſo that, in the outſet, there appears to be a clear improvement of fifty pounds, a year. In twelve or fourteen years, it may be worth twice that rent, the ſoil being deep, and of a quality which, though not rich, is ſuited, by ſituation, to both corn and graſs. When the ſtipulated improvements are made, by the firſt occupiers, the three hundred acres will be worth, at leaſt, two hundred pounds a year; namely, FOUR TIMES ITS FORMER VALUE.

Another inſtance of river embankment occurs in *this* townſhip. The commiſſioners, under the Act of Incloſure, have wiſely ſecured the lower grounds to be incloſed, from the waters of floods, which have, hitherto, occaſionally overflowed them. The remedy, in this caſe, was eaſy: a partial embankment, only, was neceſſary; and the bank, in the parts where it was wanted, ſeldom required

to

to be raiſed, above two or three feet high. Nevertheleſs, the advantage obtained, at this eaſy expence, is that of enabling the reſpective occupiers of the lands under incloſure, to change them, from a ſtate of unproductive ſward, to that of arable land; and, by that means, to improve them, *perhaps*, to three times their preſent value.

If, in the MANAGEMENT OF ESTATES, any ſuperior faculty be requiſite, it is that of being able to ſtrike out and execute INTRINSIC IMPROVEMENTS; ſuch as give a *permanent* increaſe of RENTROLL,—without diminiſhing the RESPECTABILITY of its owner.

8.

FENCES.

THE PARTICULAR articles which require to be noticed under this head are,

1. Gates,
2. Fence Walls,
3. Poſts and Rails,
4. Dead Hedges,
5. Live Hedges.

I. GATES.

I. GATES. The common field gates of this country are, in general, made *ſlighter* and much *taller* than thoſe of other Diſtricts. In Surrey and Kent, three feet eight or nine inches is the ordinary height of a gate; which is, there, compoſed of four common bars, and a ſtrong top rail. Here, gates have generally ſix or ſeven bars, all equally ſlight; and the common height is five to ſix feet.

HORSES are the greateſt enemies of gates. A low gate, let its ſtrength be almoſt what it may, is no fence againſt a reſolute powerful horſe. If he can place the *muſcular part of his cheſt* firmly againſt the top rail, ſcarcely any ſtrength of wood can reſiſt him. But if the top bar be placed high enough, to receive his *windpipe*, inſtead of his cheſt, his power of injuring the gate is, in a manner wholly, taken away. It is, therefore, no wonder that, in a country where the breeding of horſes has long been a common practice, HIGH GATES ſhould have grown into common uſe.

The HANGING OF GATES is an art little underſtood, even by the hangers of gates themſelves; though highly intereſting and uſeful in Rural Economy.

A perſon, here, who has paid unuſual attention to the ſubject, and who has, in reality, made

made himself master of it, still continues to hang his gates upon *pivots*, fixed at the feet of the hartrees *.

This was undoubtedly the original method of hanging gates, and is, perhaps, all things considered, the best.

It is probable, that, in the infancy of the art, the foot of the hartree was itself formed into a pivot, while the upper part of it was confined to the post, or perhaps to a tree, with a rope or a withey.

In the instance under observation, the upper part of the hartree is hung, in the usual manner, with a hook and eye; and the foot of it is shod with a PIVOT OF IRON, set upon a large *hard stone*.

The great ADVANTAGE of hanging gates on PIVOTS is that of their being *readily altered*, with respect to *fall*, or *catching*: moving the pivot stone a quarter of an inch, this way or that, with an iron crow, is frequently a sufficient regulation: the pivot, too, takes part of the *weight* of the gate.

But gates, to be hung with pivots, require a peculiarity of CONSTRUCTION. Every gate, when

* HARTREE; the principal end-piece, into which the bars are mortised, and by which the gate is hung: opposed to the HEAD, the opposite end-piece.

when ſhut, ought to hang *plumb* and *level*; that is, the head ſhould be, everyway, upright, and the bars horizontal.

This requiſite, however, and at the ſame time a proper *fall*, cannot be had in a gate made, *in the ſquare*, and with a *ſtraight hartree*. Either the lower part of the hartree muſt be *crooked*, or the gate muſt be made, *out of the ſquare*; that is, the bars muſt ſtand ſomewhat obliquely, not perpendicularly to the hartree; and in *this* caſe the pivot muſt be placed, not in the center, but on the *outſide of the foot*: the firſt to throw the point of the pivot *behind* the pin of the upper hook, to give the gate a fall when open at right angle; and the latter, to throw the point of the pivot *without* the pin of the hook, to give the gate a fall, at the poſt, and make it catch with certainty.

This being underſtood, it is eaſy to conceive that, if the lower end of the hartree be crooked, and if the elbow or convex ſide of the bend be directed, not to either poſt, but towards the middle of the gateway, the neceſſary falls may be had, without throwing the gate out of the ſquare, or the pivot out of the centre of the hartree.

I mention this method of hanging gates

the rather, as, notwithſtanding its advantages, it is grown into almoſt total diſuſe; owing, it is very probable, to a want of knowledge of the proper principle of conſtruction. I ſhall, in another Diſtrict, have occaſion to ſpeak fully of the method of *hanging gates on hooks.*

II. FENCE WALLS. The common homeſtall fence of this Diſtrict is *wall*; either of brick or ſtone.—*Battoning*, in the Norfolk manner, is unknown, and cloſe *paling* ſeldom made uſe of.

In the morelands, and upon the limeſtone heights, ſtone walls are the common field fence. Live hedges, are, in theſe ſituations, ſlower of growth, and more difficult to raiſe, than they are, in warmer better ſoils; whereas, ſtones are plentiful, lying, in ſome places, an incumbrance to the ſurface.

Inhoſpitable and unornamental as naked ſtone walls may ſeem, they are, in many ſituations, the moſt eligible fence:—cheap and durable.

They are of two kinds, "double" and "ſingle:" the latter, which are compoſed of ſingle ſtones, piled one upon another, are a ſufficient fence againſt ſtock, provided they be raiſed high enough; but are liable to be thrown

thrown down, by the wind. The former, which are built in the common wall manner, but without mortar, are more expenſive in the firſt inſtance; but, if properly raiſed, will endure for a length of time, with little or no repairs.

The MODERN FENCE WALL, of which many miles have been built in conſequence of the new Incloſures that have lately taken place, is of the following form and dimenſions.

The *height* five feet. The *width*, at the baſe, twentytwo inches, narrowing to ſixteen inches, at the top; which is *coped* (as a guard againſt ſheep) with the wideſt and flatteſt of the ſtones, laid aſide for this purpoſe.

A frame of wood, of theſe dimenſions, is ſet up, as a *gauge*, and as a guide to the builder.

The loweſt *price* which has, I believe, been given for raiſing, carriage, and walling, is five ſhillings and ſixpence, for a rod of ſeven yards. But a ſhilling, ayard, may be taken as a more medial coſt. Each yard takes about a three-horſe-cart load of ſtones.

III, POSTS AND RAILS. In moſt countries, the prevailing *temporary fences* are hurdles. Poſts and rails are only uſed for

the defending of young hedges, and for other permanent purpoſes; being generally put down by a carpenter, and are ſeldom removed, until they become uſeleſs as a fencing material.

But, here, they are conſidered in a different light. They are (ſpeaking generally) the only temporary fencing in uſe. If a piece of ground require to be divided, for one ſeaſon, or for a few weeks, a line of poſts and rails are run acroſs it; not by a carpenter, but by a common farm laborer. And, when the purpoſe is anſwered, they are removed and laid up, for another occaſion.

I mention this circumſtance, as poſts and rails are more durable, and a much better fence againſt horſes and cattle, than hurdles are; and the labor of putting down, and removal, is much leſs than inexperience may imagine.

IV. DEAD HEDGES. The *ſtake-and-edder* hedge prevails in this Diſtrict, and is, in general, conſtructed with uncommon ſkill. The ſuperiority of conſtruction lies, principally, in the *eddering*.

In other places, the EDDERS are *trimmed* up to naked rods: here, the ſpray, towards the top, is left on. Theſe ſprayey tops, being wound

wound round the bodies of the ſucceeding edders, lay hold of the ſtakes, thereby preventing their riſing. If the twigs of the edders be inſufficient, brambles, or other pliable bruſhwoods, are wound in, with the ſame intent.

But the moſt effectual way of preventing cattle from throwing off the EDDERS, which method is here ſometimes practiſed, is to carry on the two operations of eddering and filling together, *burying the ſprayey tops of the edders among the filling*; by which means they are effectually ſecured from the horns of cattle; and even, while they remain ſound, from the hands of hedgebreakers.

V. LIVE HEDGES. The management of hedges appears to me a matter of ſo much importance, in the management of an ESTATE, and is a ſubject to which I have paid ſo much attention, that I always find it difficult, whenever I ſit down to write upon it, to confine myſelf within due limits.

In this Diſtrict, I find ample matter to animadvert upon. The fineſt hedges in the kingdom (if any one particular ſpot can claim a ſuperiority) are now growing in *this* neighbourhood; and more new ideas, reſpecting the management of hedges, have occurred

curred to me, in the Diſtrict now under notice, than in all the others I have examined. It would therefore be wrong to treat the ſubject ſlightly, in this place. But I will endeavour to compreſs the matter, which I have accumulated, within as narrow a compaſs as may be.

The ſubdiviſions which the ſubject, in this place, requires are:

1. The ſpecies of hedgewood.
2. The method of planting new hedges.
3. The method of defending them.
4. The method of cleaning and training.
5. Their after management.
6. The treatment of old hedges.

1. The prevailing HEDGEWOOD is the *hawthorn*. Formerly, it was in this, as in other places, gathered in the woods and rough grounds. But, at preſent, and for ſome years paſt, "garden quickwood" has been pretty generally, though not yet univerſally, planted.

But although the hawthorn is the common hedgewood of the Diſtrict, and, in ordinary ſituations, may be the moſt eligible, I have ſeen *crabtree* uſed on cold ſoils, as well as in bleak ſituations, with great ſucceſs. In an inſtance where crabtree and hawthorn were planted,

planted, alternately, by way of experiment, the crabtree plants have outgrown thoſe of the thorn, in a ſtriking manner. In ſix years, they have acquired ſtems as thick as the wriſt, with tops ſufficient as a fence, againſt ordinary ſtock.

Upon the Wolds, I have obſerved the *elder*, a plant which braves the bleakeſt ſituation, made uſe of as a hedgewood; but never ſaw it planted with ſufficient judgment, to anſwer the intended purpoſe. Nevertheleſs, in the abundance and luxuriance of this plant, upon the moſt expoſed parts of the Wolds, it is evident that, with proper management, it might at leaſt be made a ſkreen to better hedgewoods.

The *holly* I have ſeen raiſed (in the practice of a man who has paid great attention to the buſineſs of hedgeplanting, and in this particular with great ſucceſs) with an unuſual degree of rapidity and certainty.

The ſecrecy of the art lies in the *time of tranſplanting:* a holly tranſplanted, in SUMMER, ſcarcely receives a check from the removal: a fact, this, which few planters are aware of.—Thouſands of hollies are every year deſtroyed, by removing them in the winter months.

2. PLANTING. The common *method* is to turn a ſod, ten or more inches wide, upon the brink of the intended ditch, and, behind this, to ſet the plants, in a leaning poſture; covering the roots with ſome of the beſt of the mold the ditch affords; and, behind the plants, to lay the remainder of the excavated earth, in a low broad bank.

The ordinary *ditch* is very ſmall; barely affording mold to back up the plants with. Neither the ditch, in front, nor the bank, behind, are conſidered, as they are in Norfolk, a guard to the young hedge.

The Pickering INCLOSURE BILL orders, that the ditches, in the *lower grounds*, when they are neceſſary as drains, ſhall be made four feet wide, and two feet and a half deep. But, for the *uplands*, no limits are preſcribed; the diſtance, between the outer brink of the ditch, and the line of hedgewood, being the only thing limited. This width is fixed, throughout, at four feet and a half. In this caſe, the outer brink of the ditch being the boundary line of each man's property, and a narrow ditch, only, being wanted, a ſlip of whole ground is left between the inner brink and the firſt turned ſod, for planting the quick behind.

One

One deviation, however, from this general mode of planting under the Inclosure Bill occurs. In this instance, a narrow trench, only, is dug against the boundary line; leaving sufficient room, between the inner brink of the trench, and the line of quick, to place the dead fence; by which means the owner of the land, getting his young hedges within his own premises, is no way liable to the ill-nature or negligence of his neighbours. And, instead of laying in the plants behind the first-turned sod, the ground is dug four or five feet wide, and the plants set in a trench, upright, in the nursery manner; having, in this case, a line of prepared earth on either side to feed among.

Nor is this the only instance I have met with, in the District, of PLANTING HEDGE-WOOD ON A LEVEL. The same judicious planter has, in dividing upland inclosures, planted hedges without any ditch whatever. His practice has been to plow a slip of ground, on each side of the intended line of the fence, the preceding spring; and having previously dunged it, to plant it with potatoes. During summer, the land is repeatedly cleaned with the hoe; in autumn, the potatoes being removed, the entire slip is gathered into a ridge,

a ridge, with the plow; and, the enſuing ſpring, the quick is planted, nurſery-wiſe, in a trench, run along the middle of the ridge. The ſucceſs of this method has proved equal to what might be expected, from management ſo obviouſly judicious.

Another new idea, which has been ſtruck out, and carried into practice, by the ſame perſon, is that of SORTING HEDGEWOOD PLANTS: not according to the thickneſs of their ſtems, or the ſize of their tops, but agreeably to the ſtrength of their roots. When the plants are put in, indiſcriminately, the ſtrong ſoon outgrow, and overpower, thoſe which are weaker. But plants, which are judiciouſly ſorted, riſe together, without deſtroying each other. Beſides, in doing this, many worthleſs plants are thrown aſide, and thoſe which are weak are reſerved for ſuitable ſituations; while the ſtrongeſt are planted where the greateſt ſtrength is required.

But the *boldeſt* idea I have met with in hedgeplanting is that of BURYING THE PLANTS! by covering up their heads, an inch or more deep, with mold: and this, not as an experiment, but in the practice of a common laborer.

The

The method of planting, in this caſe, is the common one of ſetting the plants behind the "cape-ſod," or firſt-turned ſpit. But inſtead of leaving the heads two or three inches above ground, the plants are ſhortened, and the heads placed about an inch below the ſurface.

Obſerving a work of this kind, preſently after it was executed, I waited with impatience to ſee the event. In due ſeaſon, the plants made their appearance; not in a number of irregular ſpreading ſhoots, as from an expoſed head; but riſing, with one, or perhaps two or three, ſtraight upright ſhoots, of peculiar ſtrength and beauty.

They did not, however, riſe at the ſame time; ſome of them remaining in the ground, ſeveral weeks, after the earlieſt made their appearance. The covering of mold, therefore, ought, perhaps, to be as fine, and laid on as light as poſſible, to prevent obſtructions to the tender ſhoots in riſing *.

The

* On cloſe examination, I find, the talleſt ſtrongeſt ſhoots riſe from ſuch as were barely, or perhaps impartially, covered with mold: ſuch as were buried deeper are, *at preſent* (in the month of Auguſt, the firſt year of planting), ſhorter and weaker; owing, perhaps, to their riſing later in the ſpring. It is therefore probable that the lighter and thinner

The advantage of burying the plants appears to be the valuable one of giving the young hedge an upright tendency, and thereby preventing the ſtrength of the roots from being expended, on uſeleſs ſide ſhoots. Plants, thus raiſed, take the growth, and probably the habit of SEEDLING plants. The roots, in this caſe, may be conſidered as PREPARED SEEDS, furniſhed with a peculiar ſtrength of vegetation.

3. DEFENDING. Poſts and rails are the common dead fence. Sometimes one, ſometimes two rows: a moſt expenſive way of defending a young hedge.

In the lower parts of the Vale, where ſtones are not too numerous, and where deep ditches are requiſite, the Norfolk method might be introduced with great propriety *.

But, in ſtoney ſoils, that method is impracticable: and, there, two rows of poſts and rails, or ſome other dead fence adequate to them, are, in moſt caſes, abſolutely neceſſary to good management.

It

thinner the covering, provided it be ſufficient to prevent ſide ſhoots, the more eligible is this practice. Sorting the plants, too, agreeably to the ſtrength of their roots, is probably requiſite.

* See NORF. ECON. Sect. LIVE HEDGES, Subd. V.

It is therefore wiſe, in the framers of Incloſure Bills, to ſecure the right of placing fences, during a certain number of years, upon neighbouring allotments, as guards to the young hedges *.

I have obſerved, in more than one inſtance, the good effects of ſetting a ſharp *ridget of earth*, on the *outer brink* of the ditch, as a guard to the face of young hedge plants; eſpecially againſt horſes. In one inſtance, a young hedge was defended by two ſmall ditches, one on either ſide, with banklets of this kind, without any dead fence whatever; and this, too, againſt well bred hunters: ſuch as would, in a chace, have taken the hedgling and both ditches, without heſitation. Cattle are leſs terrified with theſe devices.

The practice of pricking thorns into the firſt-turned ſod, upon the *inner brink* of the ditch, as a guard to the face of the quick againſt ſheep, affords a degree of temporary ſecurity; but deprives the plants of that air and exerciſe, which is neceſſary to a luxuriancy and firmneſs of growth.

4. TRAINING. This department of the management of hedges is too much neglected, in

* See Sect. INCLOSURE, p. 79.

in all countries. The planting, and the firſt erection of guard fences, generally receive a tolerable ſhare of attention. But repairing theſe fences, from time to time,—deſtroying weeds,—and giving the young plants a proper tendency, are matters which are ſeldom conſidered as eſſential to ſucceſs.

In this Diſtrict, the *front fence* is, in general, too little attended to, or neglected too long; the young plants being frequently brouzed and ſtinted, before the neceſſary guard be thought of, or placed.

With reſpect to *weeding*, however, the Diſtrict is above mediocrity. But in regard to *training the plants* themſelves, by ſtriking off the luxuriant ſide ſhoots, and thereby promoting the upward growth of the hedgling, it is very deficient.

I have, nevertheleſs, had frequent opportunities of obſerving one inſtance, in which this requiſite buſineſs, in the raiſing of hedges, has been executed in, perhaps, a ſingular manner. In this inſtance, each plant is trained with a *ſingle ſtem*,—*pruned* in the nurſery manner.

One advantage, of this method, is that of rearing *every* plant, with a degree of certainty; the tops being, in this operation, attended

to,

to, as well as the ſtems: thoſe of the ſtronger plants being leſſened, to give head-room to the weaker.

Another very great advantage, eſpecially on a ſheep farm, is that of getting the young plants out of harm's way. Sheep are dangerous enemies to young hedges; and every expedient to guard againſt their miſchievouſneſs, in this reſpect, deſerves at leaſt a trial. Strong plants, judiciouſly planted, and trained in this manner, may, with a degree of certainty, be got out of the reach of ſheep, in three or four years.

The labor is conſiderable, but by no means exceſſive. In this one inſtance, the expence of labor appears to be greatly exceeded by the advantages obtained by it.

The pruning ſhould be done in winter or ſpring, while the ſap is down; or while it is riſing; not in the ſummer ſeaſon.

5. AFTERMANAGEMENT. In this department, the Diſtrict under ſurvey excels: not in the manner of cutting, but in the frequency of it. Many young hedges are cut, before they are twenty years old; and the cutting, of ſuch as are thriving at leaſt, is uſually repeated, every five or ſix years; a practice which ought to be univerſally followed.

lowed. Nothing is more injurious to a hedge, than unfrequent cutting.

The prevailing *method of cutting* is that of "buck-heading;"—namely, cutting the ſtems off level, about three feet high above the level of the incloſure; generally winding a few ſtraight boughs, horizontally, between the heads of the ſtems, to prevent ſtock from forcing through between them. A more *ſimple*, or a *cheaper* method than this, cannot, perhaps, be deviſed; eſpecially as the *ditch* is ſeldom touched; the roots being purpoſely ſuffered to ſtrike acroſs it; by which means they enjoy free paſturage on either ſide.

On the Malton ſide of the Diſtrict, the prevailing method of cutting is that of *plaſhing*, in the Midland manner: an operation which I ſhall have occaſion to ſpeak fully of, in its proper place.

6. OLD HEDGES. The practice of *replanting* wornout hedges, in the Norfolk manner, I have not met with, in this Diſtrict.

Stopping *breaches* with *dead hedging*, thereby effectually preventing their ever cloſing again, is a piece of unpardonable management, which is nowhere more prevalent, than in the Vale under obſervation.

One

One inſtance of exertion, however, in order to RECLAIM a live fence, from a row of large old thorns, the remains of a neglected hedge, occurs in this Diſtrict, and would do credit to any country. It is the only one of the kind I have met with.

The buſhes, or ſeparate detachments of the old hedge, being trimmed, on both ſides, and the main ſtems cut out, at the ground, or headed at ſuch heights as circumſtances required, the long ſlender boughs, growing in the line of the fence, were trained into the vacancies, with ſtrong ſtakes, in the ESPALIER MANNER: a bank of earth having been previouſly thrown up, and the loweſt ground-boughs LAYERED in it, in order to ſtrike root, and ſend up freſh plants, to aſſiſt in filling up the vacancies, effectually.

This mode of treatment is not applicable to ſuch hedges, only; but to every live hedge, in which wide VACANCIES are found. The beſt time for filling them up, in this manner, is when the hedge is felled to the ground.

Another inſtance of practice, in the management of old hedges, which had been planted on broad banks, with *ditches on either ſide*; and which, through the narrowneſs of

the paſture, and the neglect of timely cutting, were become ſtunted, and thin of ſtems, merits notice.

The thorns, in this caſe, were felled to the ground; the ditch, to the ſouthward or weſtward of the hedge, re-made; and that, on the north or eaſt ſide of it, *filled up* with the excavated mold. By theſe means, the plants were ſupplied, immediately, with freſh paſturage in made earth; and let looſe to feed, at large, in the adjoining incloſure. The effect is ſtriking.

Perhaps, REVERSING THE DITCH of an old hedge (with a *ſingle* ditch) might INVIGORATE it, in a ſimilar manner, by giving the plants a freſh field of paſturage. The experiment, however, ought to be tried with caution. Depriving old plants of *all* their main roots (though they were at the ſame time cut off by the ground) might be dangerous.

GENERAL OBSERVATIONS. From what has been ſaid, on the ordinary treatment of hedges, in this neighbourhood, it is evident, that their ſuperiority is not owing to an excellency of management. The richneſs of the ſoil; the neglect of the ditches; the frequency of cutting; and, above all, the preſent

ſent AGE of the hedges, account ſufficiently for their PRESENT FLOURISHING STATE.

Thoſe which ſtrike the eye with a peculiar luxuriancy of growth, are about FIFTY YEARS OLD: and it is abundantly evident, that hedges, growing in a good ſoil, may, until they have reached *that age*, be *headed fence-high*, with a degree of ſafety. But, on a nearer view, it appears to me equally evident, that the practice cannot be exerciſed, *in perpetuity*, with any degree of propriety.

On examining hedges, which have not been planted SEVENTY YEARS, and which have been treated invariably in that manner, I find they have already received irreparable injury. The underling plants are, already, ſo far deſtroyed, as to leave vacancies, of three feet or more in width; while the maſter plants, now no longer of themſelves a fence againſt ſheep, have acquired ſtems of a tree-like ſize.

FELLING TO THE GROUND, and training a range of *new ſtems*, is the only effectual remedy of this evil. But this, when deferred too long, is impracticable, or at beſt uncertain. Large old ſtems will not, always, ſurvive the operation; but if applied,

in time, and with due care, the remedy is certain.

It would be difficult, perhaps, to prescribe rules for FELLING HEDGES TO THE GROUND, by their *ages*, or the intervals of time between the fellings. *Perhaps*, no hedge ought to stand more than FIFTY YEARS, from the first raising, nor more than THIRTY YEARS, between the *fellings*.

But, by their SIZES, and the state of their growth, some general rules may with propriety be mentioned. No *stem* (howsoever healthful, nor how sizeable soever to the neighbouring stems), of more than a *foot in circumference*, ought to be suffered to remain standing.

If there be a great *disparity*, as there generally is, in the *sizes of the stems*, either the entire hedge ought to be felled, before any of them acquire the limited size; or, in heading them, the larger ought to be *shortened*, *proportionably to their respective sizes*; in order to lessen their destructive tendency, and to give the weaker an opportunity of gaining, at least, a temporary ascendency *.

If

* An expedient of this kind I have seen executed with every appearance of success.

If the plants, let their age and ſize be what they may, grow *moſſy*, or wear the general appearance of *ſtuntedneſs*, they ought to be removed, that a more healthy race may be trained up, in their ſtead.

The ſame as to HEADING. No particular age can be pointed out, for the firſt cutting; nor can any certain interval of time, between the headings, be preſcribed, with ſtrict propriety. Soils and ſituations influence the growth of trees; and, viewing the management of hedges in a general light, the tops ought to acquire a degree of USEFULNESS before they be taken off.

A *bough, ſix or eight inches in circumference*, is large enough for a *ſtake*; and, when the ſtrongeſt have got to this ſize, the remainder are generally fit for the *fillings* of dead hedges: that, therefore, is the ſtate in which they ought to be cut.

It would, in my opinion, be better management, *in a man who occupies his own eſtate*, to burn them, and give their aſhes to the winds, than to ſuffer them to remain on the ſtems, after they have reached that ſize.

But, *in a tenant*, who has no permanent intereſt in the hedges he occupies, neglect is

leſs criminal.—It matters not, to him, whether the live hedges upon his farm remain ſufficient fences, *one* or *two* centuries. He is no way concerned in the purchaſe value of the eſtate, unleſs it be in the depreciation of it. His plan of management (if he has any in this reſpect) is to make his hedges ſubſervient to his own intereſt; eſpecially when he has no certainty of continuing in poſſeſſion.

Theſe circumſtances are not mentioned, here, with a view of breeding ill-blood between landlords and tenants; but to endeavour to convince the former, that it is incumbent on them to pay ſome attention to the live hedges upon their eſtates.

It is now a cuſtom, pretty generally adopted, upon wooded eſtates, to appoint *woodwards*, for the preſervation of timber and underwood.—And, upon every large eſtate, lying in an incloſed country, it is, in my opinion, equally neceſſary to appoint a HAYWARD, for the preſervation of its hedges.

An EXPERIENCED HEDGER would, perhaps, be the fitteſt for this employment. In ordinary caſes, as where heading, only, might be requiſite, *orders* might be ſufficient; but to the raiſing of new hedges, and the renewal

of

of old ones, *perſonal attention* ought to be paid, not only to the planting and the felling, but to the fencing and the weeding, until the new or the renewed hedge be out of danger.

9.

HEDGEROW TIMBER.

THIS is an intereſting ſubject to the proprietors of incloſed eſtates: and no country affords a better field for obſervation, than that under ſurvey.

The old-incloſed parts of this neighbourhood, when ſeen at ſome diſtance, have the appearance of woodlands; the incloſures being moſtly narrow, and full of hedgerow timber.

The age, on a par, is about fifty years. In half a century more, the value of the timber, of ſome parts of it, if ſuffered to ſtand, will probably be equal to the value of the land: a circumſtance, this, of no ſmall import to the *owner*. But the detriment to the *occupier* requires to be conſidered.

In this country, it ſeems to be a general idea, founded perhaps on experience, that

lofty hedgerows are *beneficial* to *graſs land*; increaſing its productiveneſs, by their warmth, and giving ſhelter and ſhade to paſturing-ſtock. The roots, even of the aſh, are conſidered as *inoffenſive* to land, in a ſtate of *graſs*; in which ſtate, the grounds thus loaded with hedges and timber trees, is almoſt univerſally kept.

Indeed, it would be impoſſible, in their preſent ſtate, to occupy them as *arable land*. There are entire incloſures, every foot of the areas of which muſt neceſſarily be occupied by *aſhen roots*; nevertheleſs, they give an ample ſupply of hay and paſturage. One to two tons of hay an acre. And, in many of them, three acres will afford ſufficient paſturage, for two cows, of the largeſt ſize. The rent, from thirty to forty ſhillings an acre. Strong evidences, theſe, that the *roots* of the *aſh* are not very injurious to *graſs land*.

It is evident, however, that the *oak*, when ſuffered to thruſt its *low ſpreading head* into the incloſure, is injurious to the herbage beneath it; that the *leaves* of the *aſh* are very detrimental to aftergraſs; and that the *hedges* are annually receiving irreperable damage;—no general plan of training up the trees, with tall ſtems, having, I believe, in any inſtance been adopted.

GENERAL OBSERVATIONS. From what is here mentioned, we may conclude, that the advantages accruing from the planting of timber trees, in the hedges of incloſed common-fields, of a ſoil, and lying in a ſituation, adapted to *graſs*,—are far ſuperior to any diſadvantages ariſing therefrom, even where they have been ſuffered to grow, in a ſtate of almoſt total neglect.

Land which has lain open, and which has been kept in a ſtate of *aration*, during a ſucceſſion of ages, is equally productive of *graſs* and *trees*. And it is generally good management, to let it lie in graſs, for ſome length of time, after incloſure.

In this neighbourhood, it is evident to common obſervation, that *trees* flouriſh, with unuſual vigour, in the newly incloſed lands of *arable* fields; and that their injury to *graſs land* is inconſiderable, when compared with the value of the *timber* they produce. The *low ſpreading heads* of the *oak*, and the *leaves* of the *aſh*, appear to be the chief inconveniencies, of theſe two ſpecies of trees, to *graſs land*.

But an alternacy of *corn* and *graſs* is generally eligible, on lands which our anceſtors have made choice of for common fields; and the *roots* of the *aſh* are not only obſtructions

to

to the plow, but the general nature of the plants is, in a ſingular degree, inimical to *corn*.

It is, therefore, neceſſary to eradicate the *aſh* from the hedgerows, before the land be again broken up for arable; or to preclude this tedious operation, in the firſt inſtance, by planting oak in its ſtead.

The HEAD of the OAK may be raiſed to ſuch a height, as not to be injurious to *graſs*, nor to the *hedge* while yet in a youthful ſtate, even though it were ſuffered to run up to its natural height.

Whenever the incloſures are broken up for *corn*, the *hedges* ought, in common good management, to be headed, and kept in a dwarfiſh ſtate; in which caſe TALL-STEMMED OAKS would be a valuable ſource of TIMBER, without being, in almoſt any degree, injurious, either to the HEDGE, or to the CORN, growing under them.

But the TRAINING OF YOUNG OAKS, and the GENERAL MANAGEMENT OF HEDGEROW TIMBER, cannot, with any degree of prudence, be left to a mere occupier. Viewing hedges as nurſeries of timber, a HEDGEMAN becomes eſſentially neceſſary to every landed eſtate.

DIVISION

DIVISION THE SECOND.

WOODLANDS AND PLANTATIONS.

I.

NATURAL WOODS.

THE VALLIES, which ſever the limeſtone heights, on the north ſide of the Vale of Pickering, and give paſſage to the rivers and brooks, that take their riſe in the morelands, it has been ſaid, are moſtly filled with wood. Formerly, it is probable, conſiderable plots of woodland were likewiſe ſcattered, at the feet of thoſe heights; but, if there were, moſt of them are now done away: ſome few patches, however, remain.

On the ſouthern banks of the Vale, too, are ſcattered ſome valuable tracts of woodland.

The

The TIMBER of theſe woods is chiefly OAK, with a ſmall proportion of ASH. BEECH, even upon the limeſtone heights, a ſituation to which it is peculiarly adapted, ſeldom if ever occurs, in *natural* woods: a degree of evidence, this, that the OAK and the ASH are *natives*, lineally deſcended from the ancient foreſts, which heretofore occupied theſe hills; and that the BEECH is *not a native* of this part of the kingdom. The limeſtone heights of Glouceſterſhire, Herefordſhire, and South Wales, are hung on every ſide with BEECH, growing, to all appearances, in a ſtate of nature.

The information which I have gained, reſpecting the woodlands of the Diſtrict under ſurvey, falls under the following heads:

1. Raiſing.
2. Diſpoſal.
3. Felling.
4. Timber.
5. Bark.
6. Carriage.

I. RAISING. The practice of raiſing woods from ACORNS, a practice which, formerly, has evidently prevailed, in different parts of the iſland, cannot eaſily be traced, in this. In ſome few inſtances, however, *art* may have been employed; but the generality of the old, well timbered woods, which were ſtanding within the preſent century, but which

which now are nearly extinguiſhed, have, it is highly probable, got up, *fortuitouſly*, from ſeedling plants riſing in *neglected roughets*: a ſpecies of propagation, which is ſtill obſervable, in almoſt every woody waſte; and is, in truth, NATURE'S ONLY METHOD of propagating TIMBER OAKS.

An OAK, which ſprings from ſeed, in an *open plain*, throws out horizontal branches, on every ſide; and, being browzed upon by cattle, takes a *ſhrub-like* form. But oaklings, riſing in a *thicket*, are ſecure from the bite of cattle, and are taught, by ſelfpreſervation, to ſhoot upward, with a *ſingle ſtem*; the ſooner to gain the aſcendency of the ſhrubs, which ſurround them.

This early *habit* of ſhooting upward, perhaps, afterward promotes an upward tendency. It is alſo probable, that plants, whoſe *conſtitutions* are naturally weak, are unable to cope with the difficulties which ſurround them; conſequently, that thoſe, which ſtruggle through hardſhips ſo evidently great, are of an aſpiring robuſt nature. Be this as it may, it is obſervable, that oaklings, which riſe naturally in thickets, generally make tall vigorous trees.

But moſt of the woods, which *at preſent* remain,

remain, on *this* ſide of the Vale, have been raiſed from STOOLS of timber trees, formerly taken down.

This method of raiſing woods is called "ſpringing" them; or, with greater propriety, RE-SPRINGING them: a practice which has long been prevalent, in this country; where COPPICE WOOD is of leſs value, than it is in moſt others,—*fuel*, *hedging materials*, and a few *firkin hoops* being the only ſaleable articles.

When a wood is intended to be RESPRUNG, the timber is felled a few inches above ground, leaving the bark of the ſtools as entire as poſſible.

Before the young ſhoots make their appearance, the GROUND is, or ought to be, finally cleared, from the fallen timber and topwood, and the FENCES made up. If the timber, or topwood, be ſuffered to remain among the ſtools, until after they have made their firſt ſhoot, much miſchief is neceſſarily done, in getting them off. And, if the young ſaplings be ſubjected to the bite of ſtock, eſpecially in their infant ſtate, the loſs will not readily be retrieved.

Formerly, defending the timberlings from foreign enemies was the only care beſtowed upon

upon "young ſprings;" and this, perhaps, not very rigidly attended to. Now, the fences are pretty ſtrictly kept up, and the plants, themſelves, from time to time *weeded*, — provincially, "looked;" — that is, THINNED; the underwood and croſs-growing timberlings being, in this operation, removed; to give air and room, to thoſe which are more promiſing.

The buſineſs of WEEDING is generally deferred, until the weedling plants have acquired a degree of USEFULNESS; by which means the operation becomes doubly profitable.

The *firſt thinning*, I believe, is generally given, as ſoon as the undergrowth is large enough for STAKES, and the *ſecond*, when it is long enough for RAILS; the former being given at about *ten*, the latter at about *twenty* years old. At every *ten* years, afterward, for half a century at leaſt, poſts as well as rails may, generally, be taken, with double advantage.

TIMBERLINGS, trained in this way, will reach, in a tolerable ſoil and a mild ſituation, thirty to forty feet in height, and will meaſure from twenty to thirty inches in circumference, in about forty years.

It

It is obſervable, that when a wood is intended to be ſprung again, for timber, the entire ground is, or ought to be, cleared of every tree, great and ſmall. Single trees,— STANDARDS, — provincially, "wavers," — left in a wood, under an idea of their being too young and thriving to be taken down, ſeldom retain a luxuriancy of growth, after the neighbouring trees are removed; but, by their drip and ſhade, do certain injury to the young ſaplings, riſing round them.

It is alſo obſervable, that there is a great inequality of ſucceſs, in raiſing timber in this way: while, in ſome inſtances, there will be a tenfold ſufficiency of ſhoots to be trained; in others, too great vacancies will be found. This may be owing to MANAGEMENT, or to the AGE of the timbers taken down. A *young wood* may be ſprung, afreſh, with a degree of certainty. But, *perhaps*, there is danger, as well as difficulty, in regenerating an *old* one.

II. DISPOSAL. It has already been intimated, that the large ſeedling timbers, which formerly reared their heads in this Diſtrict, are now nearly extirpated. There is, I believe, but one eſtate, and that not of conſiderable

conſiderable magnitude, upon which any *large* timber can now be found.

1. The AGE OF SELLING is, therefore, lower here, than in moſt other countries. There are inſtances of ſapling woods being ſold, at *forty or fifty years old*; and, when ſituated near a new Incloſure, are thought to pay better, at that age, than they would have done, had they been ſuffered to ſtand a longer time.

One ſold, at *forty years old*, neated to the ſeller, about twenty pounds an acre. The ſoil a cold ſpringy clay,—worth, in a ſtate of ordinary improvement as arable land, ſeven or eight ſhillings an acre. But it would coſt a conſiderable portion of its value, to change it from a ſtate of woodland, to that ſtate. Therefore, conſidering the coſt of improvement, in one caſe, and the profit of the weedling plants and underwood in the other, it is much more eligible to keep this, or any wood ſimilarly circumſtanced, in its preſent ſtate, or to improve it, to the utmoſt, as woodland, than to ſubject it to *agricultural* management *.

* See WEST OF ENGLAND, MINUTE 35, for Calculations on this ſubject.

2. The MODE OF DISPOSAL is to ſell it, in the groſs, *ſtanding*; by *auction*, or by *private contract*. The former, however, is, for the ſeller, the moſt eligible mode of ſale; where men of property and character are bidders.

The buyers of timber are, generally, men of buſineſs; profeſſionally verſed in the value of wood; and able to make their own valuations, with ſufficient accuracy; while the ſeller is obliged to rely on the abilities, and the integrity, of a third perſon; who, being unintereſted in the ſale, wants the main ſtimulus to rigid accuracy.

But, in a SALE BY AUCTION, with a ſufficient number of bidders, the ſeller's valuation is of little conſequence: the bargain, in this caſe, is transferred to the bidders: the *conteſt* is not between ſeller and buyer, but between bidder and bidder; both (or all) of whom being judges of the lot under ſale, the ſeller has *more* than a fair chance of ſelling it, for its full value.

3. The METHOD OF VALUING grown timber is to eſtimate every tree: not, however, by an exact admeaſurement of each; but by taking the dimenſions of a few, with ſufficient accuracy. The valuer, having by this

this means adjuſted the eye, he depends afterward upon that alone; except now-and-then checking it, with the rod and line. If the trees be of moderate girt, the rod and line are ſometimes diſpenſed with, by men in great practice; who, with the arms only, can take the girt, and the ground length, with ſufficient accuracy.

III. FELLING. The practice of reſpringing fallen woods being the eſtabliſhed practice of the country, that of felling timber trees *a few inches above ground* is univerſally prevalent. Grubbing, or grub-felling in the Norfolk manner, is ſeldom, if ever, practiſed.

The PEELING of oak timber is generally done, by the day; the laborers being, I believe, invariably employed by the timber-merchant, not by the tanner: practices which are productive of a conſiderable ſaving of bark. Men, working by the ton or the quarter, or tanners, paying by weight or meaſure, will not peel the boughs ſufficiently near; it is againſt their intereſt to do it. But it is the intereſt of the timber merchant, or of the tanner, if he purchaſe by the groſs, or by the ton of timber, to peel, ſo long, as the bark will pay for the labor. This accounts

for the ſmallneſs of the twigs, uſually peeled, in this country: if the bark run freely, twigs, not much thicker than the finger, are frequently ſtripped.

The method of DRYING BARK, in this Diſtrict, is generally the common one of ſetting it, in a leaning poſture, againſt poles, lying horizontally, on forked ſtakes. But, in a wet ſeaſon, or when the ground is naturally moiſt, it is laid acroſs a line of topwood, formed into a kind of banklet, raiſing the bark about a foot from the ground. By this practice, no part of the bark is ſuffered to touch the ground: and it is, perhaps, upon the whole, the beſt practice, in all ſeaſons and ſituations.

IV. FALLEN TIMBER. For OAK timber, the principal *markets* have, hitherto, been the ports of Whitby and Scarborough. But there is, now, very little ſhip timber left. The ſeedling woods are few and ſmall; and ſaplings, in general, ſtanding thick upon the ground, perhaps three or four from a ſtool, riſe too ſtraight, and are yet much too young, for the purpoſes of ſhip building. It is a fact, however, that at preſent (1787) the ſpirit of ſhip building is ſo flat, that, ſcarce as

ſhip

ſhip timber is really become, the market is now overſtocked.

The medium PRICE of *ſhip* timber, delivered at the ports, is 3l. to three guineas, a ton, of forty feet. But the price varies with the times, and ſtill more according to the quality, that is the *crookedneſs* of the wood. Oak timber, fit for the purpoſe of the *houſe-carpenter*, may now be bought for fourteen pence, a foot.

ASH timber is chiefly worked up by the *cartwrights*; and by *coopers*, into butter-firkins, and dairy utenſils. The *price*, one ſhilling to eighteenpence a foot, in the ſtick.

This ſimilarity of price, between aſh and oak timber, is owing to ſeveral cauſes: the preſent want of demand for oak; the preſent ſcarcity of aſh; and to the circumſtance of aſh timber being, on the ſpot, at its principal market; whereas oak requires to be carried twenty miles, before it can be placed in a ſimilar ſituation.

V. BARK. Oak bark is here ſold to the tanner, ready prepared for his uſe. The timber merchant not only dries it in the wood, but ſtacks or houſes it; and generally ſhaves and *chops* it, ready for the tanpit; ſelling it to the tanner, at ſo much a quarter.

This cuſtom appears to be founded on a falſe baſis: the tanner is, or ought to be, the beſt judge of the mode of preparation, and the operation ought to paſs under his eye.

The practice of *grinding* bark does not ſeem to have yet got footing, in the Diſtrict: whenever it does, it will of courſe bring the preparation of bark into its proper channel.

The medium *price* of chopt bark, is 10s. 6d. a quarter.

VI. CARRIAGE OF TIMBER. The carriage of timber has long been a diſtinct employment, in *this* part of the Diſtrict. The price for twenty miles, the neareſt diſtance, is about 15s. a ton, of forty feet; for forty miles, the longeſt diſtance, 30s. has been given:—this is, in both caſes, *ninepence, a ton, a mile.*

Suppoſing the price of oak timber, at the ports, to be three pounds, a ton; and that it lies at the weſtern extremity of the Vale; the carriage reduces the price, in the place of growth, to 30s. a ton; which is *one half* of the price at market. But timber, which grows only twenty miles from the ports, is reduced in price, by carriage, only *one fourth* of its market price; and that grown, within

in ten miles of market, no more than *one eighth* *.

Theſe circumſtances ſhow, in a ſtriking manner, the advantage of propagating timber, in the neighbourhood of ſhip yards; and point out the impropriety of raiſing it, at a diſtance from water carriage; or ſome eſtabliſhed inland market.

2.

PLANTATIONS.

THE SPIRIT OF PLANTING can ſcarcely be ſaid to have gained a footing in the Diſtrict under ſurvey.

Of late years, the paſſion of taking down has been much ſtronger, than that of raiſing

* Some years ago, the price of ordinary aſh timber, at Scarborough, was 11d. a foot. There was an inſtance of a parcel being carried, ſomewhat more than twenty miles (the inland market being of courſe overſtocked) at the rate of 5d. a foot, for carriage. This reduced the price to 6d. a foot, in the place of its growth. Had ſuch aſh timber been carried, at thoſe prices, from the extremity of the Vale, it would have neated only 2d. a foot.

up. Indeed, in ſome parts of it, the NATURAL WOODLANDS, which abound, render PLANTATIONS the leſs neceſſary.

But upon the *wolds*, and other *heights* adjacent to the Vale, SHELTER PLANTATIONS are every where wanted; and it muſt be a matter of aſtoniſhment, to every one who gives it a moment's reflection, that the ſpirit of planting ſhould, in theſe ſituations, have lain dormant ſo long.

Upon the WOLDS, however, it has at length riſen into action. Sir GEO. STRICKLAND has ſcattered a number of ſheltering clumps, upon the heights, towards Malton; and SIR CHRISTOPHER SYKES and others are placing ſkreen plantations, upon the bleak ſwells of the higher Wolds. Should this laudable ſpirit diffuſe itſelf into a general practice, not only the face of this fine paſſage of country, but the very ſoil, or at leaſt its produce and value, will in a ſhort time be changed.

The ſkreen plantations, which I have obſerved upon the Wolds, are all of the MISCELLANEOUS kind;—pines and deciduous trees of various ſorts, mixt together.

It ſtrikes me, however, that the BEECH, alone, would be the moſt eligible tree to be propagated upon the Wolds: it is peculiarly adapted

adapted to calcareous ſoils; and thrives with ſingular vigour in expoſed ſituations. Upon the chalky hills of Surrey and Kent, it is the prevailing timber tree. Upon the hills about Amerſham in Buckinghamſhire, too, a chalky ſoil, the beech thrives with uncommon beauty and luxuriance: and its wood ſeems to be growing daily into eſtimation.

Sowing the maſts, in drills, and cultivating the intervals, is perhaps the moſt eligible method of propagating thiſt ree, for the purpoſe here mentioned.

In the VALE, the almoſt only plantations, which have been made with a view to utility, are ſmall clumps of *Scotch fir*, planted for the purpoſe of giving ſhelter, and ſhade, to paſturing ſtock.

There is one inſtance, however, in which a more regular plan of improvement has been chalked out, and executed.

This inſtance of improvement, having been proſecuted with judgment and perſeverance, and by one from whom I have received more uſeful ideas, in planting, than from any other man I have converſed with, is noticeable.

The

The *ſite* of improvement was a low moory ſwamp, lying barely above the level of a rivulet, running by the ſide of it. The *ſubſoil* a blue clay: the *topſoil* a black peat earth, of an irregular depth; varying from a foot to three or four feet deep. The *turf*, a mat of ruſhes, ſedges, and other paluſtrian weeds, equally unpalatable and unproductive, either of hay or paſturage; ſome parts of it being dangerous to ſtock. The *form* triangular: the *area*, containing nine or ten acres, an entire flat; except a gentle deſcent towards the longeſt corner. The *ſituation*, though low, extremely chilling, being expoſed, on every ſide, in a naked watery plain.

The IMPROVEMENTS, obviouſly requiſite in this caſe, were *warmth*, and a proper degree of *dryneſs*.

To obtain theſe, the rivulet and the ſurrounding ditches were deepened; and a deep counter ditch, main drain, or ſhore, ſunk at a diſtance from the boundary fence; leaving an irregular border, of five to ten yards wide, entirely round the area of the ſite of improvement; which, by this ſimple operation, alone, was removed ſufficiently out of the water's way; except at the loweſt extremity,

mity, where the main drain had its outlet into the rivulet.

The BORDER, too, by the ſame operation, was laid ſufficiently dry, for the purpoſe of PLANTING.

The loweſt extremity, and the moiſter part of the margin next the rivulet, were planted with AQUATICS; the drier parts with FOREST TREES of various ſpecies.

It is now fourteen or fifteen years, ſince this improvement was firſt ſet about. The border of planting begins already to have, at ſome diſtance, the effect of an entire plantation of equal circuit; while the area, within, enjoys all the advantages which ſhelter can give it.

What remains to be ſaid, here, reſpecting the effect of the improvement under detail, is to mention the preſent ſtate of growth, and the comparative progreſs, of the different SPECIES of FOREST TREES, upon a DRAINED MOORY SOIL *.

It is an opinion of the improver of this plot of ground, that a DRAINED MOOR is the *drieſt* of ſoils: an opinion founded on his own experience. The ſummers of Eighty-five

* The further improvement of the *area* will be mentioned in its proper place.

five and Eightyſix were very dry; the plantation made little progreſs, and the area was unproductive. This year (1787) the ſummer has been moiſt;—the trees and the graſs are equally luxuriant.

MOORY SOIL, when perfectly dry, repels water like a dry ſpunge; but, like this, when once it is ſaturated with moiſture, it retains it longer, than common earth does. But a moor, effectually drained, and placed above the level of collected moiſture, is not readily filled with water; it may therefore be juſtly ranked among the *drieſt* ſoils.

This accounts for the rapid progreſs which the BIRCH and the SCOTCH FIR (both of them mountain plants) have made in theſe plantations. In the drier parts, they are more than twenty feet high; far outſtripping every other ſpecies; except

The NORWAY SPRUCE, which, for the firſt ten or twelve years, at leaſt, thrives vigorouſly. But ſome plants of this ſpecies, planted fourteen or fifteen years ago, are getting ragged, and appear to be in an unthriving ſtate. But whether this be owing to the ſeverity of the late winters, or whether the roots, being now crampt for room, have got down to the uncultivated moor, or

the

the cold barren clay which lies under it, is uncertain.

The AMERICAN SPRUCE, too, the PINE-ASTER, the LARCH, and the VIRGINIA CEDAR, thrive abundantly, in this ſoil and ſituation; but none of theſe have been planted more than ſeven or eight years.

The ASH and the BROAD-LEAVED ELM alſo make a promiſing appearance; but the OAKS, though they look healthy, do not ſhoot upward *.

On the moiſter parts, the ALDER takes the lead. But the ASH, the ASP, the POPLAR, and the OSIER, grow with ſufficient luxuriance, to ſhew, that their ſituation is perfectly agreeable to them.

A patch of OZIERS were kept down, experimentally, as an OZIER BED. The growth was luxuriant; and the profit, the ſecond to the fifth year, ample; the produce, at leaſt, five

* This, however, is thought to be owing more to late SPRING FROSTS, than to the nature of the ſoil. *Silver firs* have done worſe than the oaks; but ſhoots, ſeveral inches in length, have been evidently obſerved to be nipped off, by *ſummer* froſts; which, it is obſervable, are much ſtronger in low than in high ſituations; owing, perhaps, to the greater quantity of moiſture in the air: This, at leaſt, accounts for the extraordinary quantity of *boar*, collected in low ſituations.

five pounds, an acre, yearly: but the plants beginning to decline, and an ozier ground not being calculated to give the required ſhelter, the experiment was not purſued.

GEN. OBS. Upon the whole, it appears to me evident, that the OSIER, the ASH, and the BIRCH are the moſt eligible ſpecies to be planted on a DRAINED MOOR; keeping them in a ſtate of COPPICE WOOD, and felling the inner and outer edges of the border, alternately: the firſt fall for ſtakes; the ſecond and ſucceeding falls for rails.

By this means a PERPETUAL SHELTER would be ſecured.

A few SCOTCH FIRS, planted at proper diſtances upon the margins, and kept pruned on the inner ſides, would add a degree of ORNAMENT, without being deſtructive of UTILITY.

DIVI-

DIVISION THE THIRD.

AGRICULTURE.

I.

FARMS.

THE SIZES OF FARMS vary, in different parts of the Diſtrict. On the WOLDS, they are principally *large*; in the VALE and the MORELANDS, *extremely ſmall.*

Conſidering the VALE, diſtinctly, more than half of its lands are laid out, in farms, under twenty pounds, a year. Perhaps, three fourths of the Vale, and the lands belonging to it, lie in farms, of leſs than fifty pounds, a year.

In the weſt marſhes, and in the RICHER PARTS OF THE VALE, low moiſt ſituations, inhabitants are thinner, and farms larger.

But viewing the Vale, collectively, there is not, perhaps, in *this* kingdom, another Diſtrict of equal extent, and of which

HUS-

HUSBANDRY is the PRIMARY OBJECT, which contains ſo great a number of *farms*, or rather parcels of land in diſtinct occupation; many of them being occupied, not by TENANTS, but by OWNERS *.

The advocates for SMALL FARMS will conceive, that a Diſtrict thus laid out muſt neceſſarily excel in huſbandry; and that the ſuperiority of management muſt, of courſe, be in proportion to their degree of ſmallneſs.

On the contrary, however, no country, perhaps, affords ſtronger evidence of the fallacy of thoſe conceptions. A mixture of good and bad management is evident, in every quarter of it; and it is on the LARGER, *not* on the *ſmaller* farms, we find a SPIRIT OF IMPROVEMENT, and a SUPERIORITY OF MANAGEMENT prevail.

Poverty and ignorance are the ordinary inhabitants of ſmall farms: even the ſmaller eſtates of the yeomanry are notorious for bad management.

It is on the larger eſtates of yeomanry, and on the larger farms of tenants, we muſt look for the beſt practice of the Diſtrict.

It

* When this was written, the WEST OF ENGLAND had not paſſed under my obſervation. (1796.)

It is not meant, that a regular gradation of management can be traced, by the magnitude of farms: many exceptions might be pointed out. Nor does it follow, from the evidence of this District, that *very large farms* are conducive to good management. An occupier of eight hundred or one thousand pounds, a year, is too fully employed, with the OUTLINES of management, to attend sufficiently to MINUTIÆ, much less to conceive and execute useful IMPROVEMENTS. His best management is to press forward, in the beaten track of the country he farms in; depending upon the ampleness of his business, to make up the deficiencies, arising from the unavoidable neglect of minutial matters.

The CHARACTERISTIC OF FARMS, in the Vale, is GRASS, with a smaller proportion of arable land.

Formerly, the area of the Vale was principally grass, and the margins open arable fields. Now, the latter is inclosed, and principally applied to the use of the dairy; while the former is much of it subjected to arable management.

Upon the whole, although the admixture of ARABLE be considerable, the Vale, in a general point of view, comes under the denomination of A GRASSLAND COUNTRY.

2.

FARMERS.

FROM WHAT has been ſaid, in the laſt ſection on FARMS, a general idea of the FARMERS of the Vale may be gathered.

Among the *lower claſs of tenants*, little information can be expected, and ſtill leſs from the *inferior yeomanry*, whoſe ſcanty poſſeſſions are too frequently marked, with an inferiority of management.

It is from the SUPERIOR CLASS OF YEOMANRY, and from ſome few PRINCIPAL TENANTS, we muſt expect to learn the beſt practice of the country. It is on the farms of men, whoſe independency, converſation, and perhaps reading, has led them to think, and act, without prejudice, we muſt expect to find a ſuperiority of general management, and a ſpirit of improvement prevail.

It has long been obſerved in the ECONOMY OF NATIONS, that where liberty is eſtabliſhed there commerce and the arts flouriſh. And

it

it is equally obſervable, in RURAL ECONOMY, that where independency reſides, there Agriculture improves. A monied man, cultivating his own eſtate, enjoys the higheſt degree of independency; a leaſe tenant the next; tenants at will the loweſt.

It has already been intimated, that, in this Diſtrict, tenants at will (ſome very few perhaps excepted) have loſt all *confidence*, and conſequently have loſt even their *ideal independency*. They *dare* not *improve* leſt ſome advantage ſhould be taken of their improvements. It has alſo been ſaid that leaſes are, yet, but little in uſe.

Therefore, among the YEOMANRY, alone, we muſt look for that degree of independency, which is eſſentially neceſſary to improvements in Agriculture.

No country, of equal extent, can boaſt of ſo numerous a body of yeomanry, as the Vale under ſurvey; nor any country, I will venture to affirm, where induſtry and frugality are more conſpicuous; or where a perſonal independency is more ſtrongly rooted, among men in middle life.

3.

WORKMEN.

THE YEARLY SERVANTS of this Diſtrict are noticeable, for the highneſs of their wages, and the lowneſs of their living, and for the length of their working hours.

The WAGES, of an able man ſervant, are twelve to fifteen pounds, ayear. During the late war, fifteen to eighteen pounds were given!

But the ſimplicity of their DIET more than compenſates for the extraordinary height of their wages. Milk ſtill remains, here, a food of farmers' ſervants. In ſome places, animal food, three times a day, is expected; here, once a day (except perhaps in haytime and harveſt) is conſidered as ſufficient.

In MALT LIQUOR, too, the farm ſervants of this country are equally moderate.

Nevertheleſs, if one may judge from their appearance, and from the quantity of labor they diſpatch, their mode of living is conducive to HEALTH.

The

The TIME OF CHANGING SERVANTS, which prevails through this country, is *Martinmas* (Nov. 22.) *. The conveniency of this time of changing ſervants, and the inconveniency of changing at Michaelmas, have been pointed out on a former occaſion †.

4.

BEASTS OF LABOR.

THE LONG AGITATED diſpute, about the ſuperiority of OXEN or HORSES, as beaſts of draught, may here be conſidered with ſingular propriety. But, I am afraid, even this country will not furniſh ſufficient evidence, for a final deciſion.

Formerly, and from time immemorial, four or ſix oxen, in yokes, led by two horſes, alſo double, were the invariable "draught"

* Except in CLEVELAND, where *Mayday* is a more general time of changing.

† See MINUTES OF AGRICULTURE—Dates 10 and 12 OCTOBER 1775.

or team of the country; not only upon the road, but in plowing. Even in ſtirring a fallow, four oxen and two horſes were generally conſidered as requiſite. And, in breaking up a fallow, two men and a boy were the common attendants, of this unwieldy expenſive team.

At preſent, there is not, perhaps, throughout the Vale, a ſingle ox employed in tillage: two horſes, with whip reins, without a driver, is now the univerſal plow team for all ſoils, in almoſt every ſtate.

Upon the road, however—that is to ſay, in farm carriages—oxen are ſtill in uſe; but ſeldom more than a ſingle pair to a carriage; —generally at the pole, with two or three horſes, at length, before them. Beſides, a number of entire horſe teams, now, travel upon the roads; things which, formerly, were unknown in the country.

On a general view, and in the opinion of men whoſe age entitles them to be judges of the ſubject, there is not kept, at preſent, one-fourth of the working oxen, which formerly were employed, in the Vale.

Shall we hence argue, that becauſe oxen have declined, they are ineligible as beaſts of draught? It might be unfair to do it.

There

There are two evident cauſes of the decline of oxen, in this country.

Formerly, there was not only much more land in tillage, but the plow of thoſe days was a heavy ill ſhapen implement, requiring at leaſt one pair of oxen extraordinary to draw it; yet, unwieldy as it was, the quantity of land, then in tillage, required that it ſhould be worked, in all ſeaſons. At preſent, the plow in uſe is admirably conſtructed;—light, and well formed for paſſing through the ſoil. With this plow, and with the land in ſeaſon, it is found, that the two horſes alone, without the oxen, are ſufficient for the purpoſe of tillage. This, in a country where the breeding of horſes had long been an eſtabliſhed practice, was a ſufficient cauſe of *the diſuſe of oxen in plowing*.

Their *decline upon the road* is, in part, owing to the ſame cauſe. Four horſes make two plow teams, and, occaſionally, a road team. This accounts, in ſome meaſure, for the increaſe of horſe teams, upon the road; but it is not the only cauſe of their increaſe. When oxen were in common uſe, the *roads* lay in their natural flat ſtate; deep in winter, and ſoft to the hoof in ſummer: now, they are univerſally a rough cauſeway of lime-

ſtones, in all ſeaſons unfriendly to the feet of oxen. Even ſhoeing is found ineffectual, when they go conſtantly upon the road.

Under this change of circumſtances, it is no wonder that the uſe of oxen ſhould have declined. On the contrary, it appears to me a matter of ſurpriſe, that ſo great a number ſhould ſtill be employed; a circumſtance which, in my mind, evinces their utility as beaſts of draught.

Even the timber carriers (an induſtrious and wary ſet of men) continue to uſe them; though their ſole employment be upon the road. They not only find them able to ſtand working, every day, provided their feet do not fail them; but, what is much in their favor, they are found to ſtand long hours, *better* than horſes going in the ſame paſture. An ox, in a good paſture, ſoon fills his belly, and lays himſelf down to reſt; whereas a ſhort ſummer's night ſcarcely affords a horſe time enough to ſatisfy his hunger.

Another advantage of oxen is, here, held out. In ſtiff pulls of every kind, moſt eſpecially in going up ſteep hills, a pair of oxen are conſidered as a ſheet anchor. Horſes, it is argued, are fearful, and ſoon loſe their feet, in a ſteep ſlippery road; while oxen, where

where they are unable to proceed, will ſtand their ground. Indeed, oxen ſeem to be conſidered as eſſentially neceſſary, in an aukward hilly country.

This idea, in a country where half bred hunters are the principal horſes uſed in draught, is no doubt well founded; but where thorough bred cart horſes are in uſe, it loſes much of its weight.

But what are thorough bred cart horſes? Why, a ſpecies of ſtrong, heavy, ſluggiſh animals, adapted ſolely to the purpoſe of draught; and, according to the preſent law of the country, cannot, without an annual expence which no one beſtows upon them, be uſed for any other purpoſe.

This ſpecies of beaſts of draught coſt, at four years old, from twenty to thirty pounds; will, with extravagant keep, extraordinary care and attendance, and much good luck, continue to labor eight or ten years; and may, then, generally be ſold for five ſhillings, a head.

If we had no other ſpecies of animals, adapted to the purpoſe of draught, in the iſland, nor any one which could be naturalized to the climate, cart horſes would be truly valuable; they being much ſuperior

to

to the breed of ſaddle horſes, for the purpoſe of draught.

But it appears to me evident, from the experience I have had, and the obſervations I have made, that were only a ſmall ſhare of the attention paid to the BREEDING of draught oxen, which now is beſtowed on the breeding of cart horſes; animals equally powerful; more active; leſs coſtly; equally adapted to the purpoſes of HUSBANDRY, (if harneſſed with equal judgment); leſs expenſive in keep and attendance; much more durable; and infinitely more valuable after they have finiſhed their labors—might be produced *.

OXEN, here, are all worked in *yokes*, and always *led*, by one or more horſes. They are uſually broke in, at two or three years old; and worked, until they be riſing ſix; when

* I do not mean to intimate, that any breed of oxen would be equally fit as horſes, for the *road only*: I have had no experience of either of them, in this kind of employment; which is foreign to the preſent ſubject: let carriers and draymen make their own election. All I contend for is, that, were a proper attention paid to BREED, oxen, and ſpayed heifers, equally as fit for the purpoſes of tillage, the carriage of manure, hay, corn, and fuel, and for every other purpoſe of DRAUGHT, in the ordinary buſineſs of HUSBANDRY, as the heavy cart horſes at preſent in uſe, might be obtained.

when they are bought up, for the Midland, or South country graziers.

Conſidering oxen as *rearing cattle*, which are worked occaſionally during the years of growth, this plan of management is eligible enough; but viewing them, abſtractedly, as *beaſts of draught*, that mode of treatment is very injudicious: they are worked while they are feeble for want of age, aukward for want of experience, and thick winded through a fullneſs of growth; and thrown up ſo ſoon as they have learnt to know their duty, and are become able to ſtand work.

A ſteer, like a colt, ought to be familiarized to harneſs, at two or three years old; but ſhould never be ſubjected to hard labor until he be five years old: from which age, until he be fifteen or perhaps twenty, he may be conſidered as in his prime, as a beaſt of draught. An ox which I worked ſeveral years in Surrey, might, at ſeventeen or eighteen years old, have challenged, for ſtrength, agility and ſagacity, the beſt bred cart horſe in the kingdom.

The SPECIES of OX, worked in this Diſtrict, will appear under the head BREED OF CATTLE.

IMPLE-

5.

IMPLEMENTS.

THE Implements of the Vale, which require to be noticed, are,

1. Waggons.
2. Plows.
3. The common ſledge.
4. Molding ſledges.
5. Machine fans.

I. WAGGONS. The waggons, and other wheel carriages of the Vale are, in general, conſiderably below the middle ſize.—A full ſized waggon does not meaſure more than forty cubical feet: the ox cart—provincially "coop"—about twentyfour feet.

Their *conſtruction*, though in many reſpects ſingular, is paſſed over, as being in nowiſe peculiarly excellent *. But they have a *defect* which

* Excepting in two petty improvements, which I have have not obſerved elſewhere. The one is a ſimple improvement of the WHEEL-WASHER—provincially "Runner"——which frequently ſticking in the end of the nave, wears off the ends of the linch-pin; thereby loſing its principal intention. The improvement is made by placing a knob on the outer ſurface of the Waſher; which, catching the

which requires particular notice; as it is not peculiar to the Yorkſhire waggon; but is common, in a greater or leſs degree, to the carriages of other Diſtricts.

The Turnpike-road Act, made in the thirteenth year of the preſent reign, orders, "that no pair of ſuch wheels (common three inch wheels) paſſing on turnpike roads, being above twenty miles from London, ſhall be wider than *four feet ſix inches*, from inſide to inſide, to be meaſured on the ground;" (that is, *four feet nine inches from middle to middle of the ruts*) "under the penalty of five pounds!"

The waggons of the Midland counties (the ſize of them extraordinary large) run the width of five feet two or three inches, from middle to middle of the rut. Thoſe of Glouceſterſhire (of the middle ſize) run four feet nine inches wide: thoſe of the Vale of Pickering only four feet three inches.

All

the end of the linch-pin, prevents its turning round with the wheel; by which means the entire friction is, as it ought to be, between the Waſher and the end of the box of the nave. Accidents frequently happen, for want of this precaution. The other improvement is a FALLING DOOR, in the bottom of the fore part of the waggon; for the more eaſy delivery of lime, coals, and other body loads.

All theſe widths are *much too ſmall* for the reſpective ſizes of the carriages: and how the framers of the Bill, above mentioned, could impoſe a reſtriction, evidently tending to deſtroy the roads, they were endeavouring to preſerve, is a matter of ſome ſurprize.

In the article ROADS, page 172, the effects of carriages, paſſing upon ſhelving roads (of the nature of which every *barrelled turnpike road* more or leſs partakes) have been mentioned. The damage will always be, in proportion to the inclination of the road, to the height of the load, and to the narrowneſs of the ſpan of the wheels, conſidered jointly.

The center of gravity of the load (including the carriage), and the two points of the peripheries of the wheels (of a two-wheeled carriage), which are in contact with the road, form a triangle. The extremity of damage is when the load is in the equipoiſe of overturning; the entire weight of the load and carriage reſting, at that time, upon one wheel; which, in that caſe, injures the road as much as a load, of much greater weight, would, in paſſing upon a level road. Whenever either *ſide* of the triangle, above deſcribed, is brought into a perpendicular poſition, the load is in the injurious equilibrium.

Theſe

Theſe premiſes being duly conſidered, it is obvious, that there are three ways of reducing the perpendicularity of the line; conſequently, of preventing a loaded carriage from being placed in ſo deſtructive and dangerous a ſtate. Firſt, by raiſing the depreſſed corner of the triangle; that is, by bringing the road nearer to a level: ſecond, by ſhortening the ſides of the triangle; that is, by lowering the center of gravity of the load; or, in other words, reducing the height of the carriage: third, by lengthening the baſe of the triangle; that is, by widening the ſpan, or placing the wheels farther aſunder. Theſe things are mathematically demonſtrable; but as they muſt appear obvious, to every one, acquainted with the rudiments of ſcience, it would be wrong to load the preſent volume, with a more minute explanation.

But the injury of the roads is only one part of the miſchief, ariſing from the wheels of carriages, running too narrow. The increaſe of draught (ſee ROADS, p. 173.), the extraordinary ſtreſs and wear of the carriage, and the evil effects of overturning,—are matters of ſtill more importance, to farmers, and other proprietors of carriages.

It would, perhaps, be in vain to conjecture

ture the means, through which the preſent widths of the ſpan of carriages have been eſtabliſhed, in different countries; each of which has its particular width; otherwiſe, the difficulty of paſſing in rutty by roads would be greatly increaſed.

In the preſent ſtate of huſbandry and land-carriage, and the preſent ſtate of roads, it appears to me evident, that GATEWAYS, alone, ought to preſcribe bounds to the width of carriages.

Farm gateways meaſure from eight feet and a half to ten feet wide. I know no extraordinary inconveniency ariſing from a gateway of the latter width; and through ſuch a gateway there would be no difficulty in conducting a carriage, with diſhed wheels, running five feet or even ſix feet wide. Five feet and a half would, perhaps, be found the beſt legal width.

This increaſe of width would operate, in a variety of ways, to the advantage of land-carriage. Roads would be leſs injured; team-labor would be facilitated; carriages would laſt longer; and loads would be leſs expoſed to danger, than at preſent.

Nor would theſe be the only advantages: the increaſed diſtance, between the wheels, would

would admit of a proportional increaſe in the width of the body of the carriage; and this of a proportional reduction of the height of the load. Advantages, theſe, beſides the additional ſtrength which the carriage would by this means receive, which appear to me too obvious to require further argument.

II. PLOW. The plow, at preſent in univerſal eſtimation in the Vale, is of the light, ſhort, winding-moldboard ſort, which, in different parts of the kingdom, goes under the name of the *Dutch plow*, or the *Yorkſhire plow*.

On the conſtruction of a ſhip, volumes have been written, without any univerſally received principles being yet eſtabliſhed. The Bermudians, who build by the *eye alone*, without either drawing or gauge to aſſiſt them, excel all other nations, in the conſtruction of ſmall veſſels (the almoſt only *produce* of their iſlands); which are remarkable as faſt ſailers, and notorious for lying nearer the wind, than other veſſels.

Different as the ſhip and the plow may be, in magnitude and general appearance, there is ſome ſimilarity, in the principles of their conſtruction; and the difficulty of fixing thoſe principles, and of reducing them to a regular

theory, is nearly the ſame in both. The art of conſtruction, in either caſe, is principally attained by practice.

In this Diſtrict, the ſpecies of plow under notice is, in general, conſtructed better than it is, perhaps, in any other; yet, even here, the plows of different makers paſs through the ſoil, with various degrees of facility and execution: nevertheleſs, though I have paid ſome attention to the different makes, I find myſelf unable to detail the minutiæ of conſtruction. Even the general principles I muſt mention with diffidence.

The great difficulty, in the conſtruction of a plow, is that of adapting it to all ſoils, in all ſeaſons, and to all depths.

If the ſoil break up in whole furrow, every inch of *depth* requires, in ſtrictneſs, a ſeparate plow, or a ſeparate regulation. Here reſts the great objection to the WINDING MOLDBOARD, which admits of no regulation in reſpect of depth.

If the *ſemi-arch*, or hollow of the hindpart of the moldboard, be raiſed ſufficiently high, to turn a thick furrow completely, it is of little uſe, in turning a thin one. On the contrary, if it be brought down ſufficiently low, to turn a ſhallow furrow properly, it is impoſſible

poſſible to turn a deep one with it, in a workmanlike manner. There is not room for it within the hollow or ſemi-archway of the moldboard. The inevitable effect of this is, either the furrow is forced away, wholly, by the upper part of the moldboard, and ſet on edge; or the moldboard rides upon the plit, raiſing the heel of the plow from the bottom of the furrow; eſpecially in plowing ſward, or other whole ground.

An UPRIGHT STERN, with a moveable HEELPLATE * to turn the furrow at any given depth, is, in this point of view, much preferable to a hollow moldboard; and if its uſe, in raiſing a creſt of mold, for the purpoſe of covering the ſeed, be added, its preference is ſtill more conſpicuous; and I ſee no reaſon why the Yorkſhire plow ſhould not receive ſo valuable an improvement.

The FOREPARTS of a Yorkſhire plow, of the beſt conſtruction, are admirably adapted to inſinuate themſelves beneath the ſoil, and to raiſe the plowſlice: a better form, perhaps, cannot be contrived.

But the plows, even of this neighbourhood, are far from being uniformly excellent, in

* See MINUTES IN SURREY.

that reſpect. The NECK is frequently too thick and the BOSOM too hollow: the former creates an unneceſſary friction; and the latter forms a receptacle for looſe mold to lodge in; and both of them are detrimental to the turning of the plit. The boſom may be made too full, but the neck cannot, well, be made too fine, on the off or outer edge.

The righthand ſide of the ſocket of the SHARE ought to be brought down to a ſharp angle, or rather to an edge; the under ſide being made flat, and as level as may be, with the under ſurface or ſoal of the plow. The part which is folded back, to lay hold of the bottom of the woodwork, too frequently forms a foul protuberance, on the ſoal; rendering the plow unſteady,—increaſing the friction unneceſſarily,—and, by raiſing up the fin of the ſhare, preventing it from acting properly.

The form of the Yorkſhire plow is not its only excellency: the ordinary PRICE of the wood work complete, is not more than ſeven ſhillings and ſixpence! the iron work about twenty ſhillings, including plates for the landſide and moldboard. *Caſt iron plates*, ſomewhat reſembling thoſe of the Norfolk plow, are now coming into uſe, inſtead of wooden

wooden moldboards. Thoſe will reduce the general price ſtill lower.

III. THE COMMON SLEDGE. This petty implement will be conſidered as unworthy of notice, by thoſe who are unacquainted with the uſes of it. Nevertheleſs, here, where it is in common uſe, it is in univerſal eſtimation.

For carrying harrows and other implements,—thorns and other rough wood,—turneps when the ground is tender, &c. &c. a ſledge is, frequently, much preferable to a cart or a waggon. Some are made ſmall and light, for one horſe; others ſtrong and large, to be drawn by a team of oxen or horſes.

The principal ſingularity of conſtruction conſiſts in a valuable addition, to the common harrow ſledge of other countries. This addition is made with two croſs pieces (like the croſs pieces of a cart or waggon), one fixed upon each end of the body of the ſledge, projecting without the ſide pieces, about ten or twelve inches, at each end. Upon the extremities of theſe croſs pieces are fixed two rails,—provincially, "ſhelvings,"—one on each ſide; thus increaſing the width and hollowneſs of the bed of the ſledge, and

thereby rendering it capable of carrying a larger load with greater ſteadineſs.

IV. MOLDING SLEDGE. This implement, I apprehend, is peculiar to Yorkſhire.

Its USE is that of ſmoothing the ſurface of meadows; at the ſame time ſpreading the dung and molehills.

The CONSTRUCTION is that of the body of the common ſledge, without its ſide rails and croſs pieces; the upper edges of the ſide pieces (of the body of the ſledge) being, for this purpoſe, made perfectly ſtraight.

In uſe, it is drawn with the face downward, and the ſide foremoſt, acroſs the ridges.

Its EFFECT is different from that of the LANDPLANE, deſcribed in the MINUTES OF AGRICULTURE; which, having a middle bar, *levels* the ſurface; whereas this, having no middle bar, only *ſmooths* it.

The FRONT BAR (namely, the *ſide* which is drawn foremoſt) forces off wormcaſts, the rudiments of anthills, and other protuberances of the ſurface; alſo collects the dung of cattle and horſes, the molehills, and other looſe incumbrances, which lie in its way.

This collection of materials being driven before the implement, grind each other down, fine

fine enough to lodge in the dimples and fiſſures of the ſward; thus ſmoothing the ſurface in a twofold way; and, at the ſame time, mixing, reducing, and diſtributing the meliorating ingredients, in the moſt effectual manner.

The FRONT BAR is ſometimes ſhod, with iron, projecting, with a hoe-like edge, before the wood work. But this is unneceſſary; and is frequently injurious, in defacing the ſward. The wood work itſelf, while the acting angle in front remains ſharp, is perhaps the beſt: but the angle ſoon wears off; by which means the implement loſes its effect, in removing the more ſtubborn protuberances. An iron bar fixed, *not beneath*, but in the *front* of the wood work, the lower edge being ſet fluſh with the face of the implement, acts in a ſimilar way to the wood itſelf, without being ſo liable, as this, to be worn away.

The uſe of the HIND BAR is to give firmneſs to the implement, and to finiſh what the front bar may, by accident, have left incompleat; the manner of acting being in both of them the ſame.

The length or width of this implement is uſually ſix to eight feet. The breadth, or dimenſion from out-to-out of the front and

hind pieces, four to five feet. The depth of theſe pieces ſix to eight inches: their thickneſs about three inches.

Additional weight, if required, is given by logs, ſtones, or other heavy materials, laid upon the croſs bars which bind the two acting pieces together. In places where a particular exertion is requiſite, the driver will add his own weight, by ſtepping upon the implement, and remaining upon it, until the occaſion be paſſed.

V. WINNOWING MACHINE. This excellent machine is too well known, as a *curioſity*, in moſt parts of the kingdom, to require, in this place, a general deſcription *. But the county under obſervation being the only one in which its *uſe* has been eſtabliſhed, in COMMON PRACTICE, it merits, in this place, particular notice.

We are probably indebted to the Chineſe, or other eaſtern nation, for the invention of this machine. I have ſeen it upon an India paper, drawn with ſufficient accuracy to ſhew, that the draughtſman was intimately acquainted

* The late Mr. *Sharp* of London made it ſeveral years. *Winlaw* of Margaret ſtreet, Cavendiſh ſquare, ſtill makes it.

ed with its uſes. The Dutch, to whom the invention has been aſcribed, imported it, in all probability, from the Eaſt Indies. Let this be as it may, it indiſputably came from Holland, into *this* country.

Its firſt introduction, into the Vale, was by a gentleman of this neighbourhood, about thirtyfive years ago. But the introducer committing this complex machine to the care of ſervants, without paying attention to it himſelf, it was, as might be expected, ſoon thrown aſide, as uſeleſs.

Some time afterwards, however, it fell into the hands of a ſenſible ſubſtantial yeoman; who, with the aſſiſtance of a friend, diſcovered its uſefulneſs, and reduced it to practice.

My father, who had made himſelf maſter of the excellencies and defects of this pattern, made one from it, with ſome improvements. This was the firſt which was made in the Diſtrict, and perhaps the firſt which was made in *England*.

The utility of theſe being ſeen, by ſome diſcerning individuals, ſeveral others were conſtructed, under my father's direction. But, notwithſtanding many of them were kept in common uſe, and viſited as ſubjects of admiration,

miration, it was ſome fifteen or twenty years before they grew into popular eſtimation.

Within the laſt ten or fifteen years, the making of them has been an ordinary employment of wrights and carpenters. At preſent, there is ſcarcely any man, whoſe farming is conſiderable, without a "Machine Fan:" and, among the ſmaller occupiers, it is not uncommon for two or more to join, in the purchaſe and uſe of one of them.

The CONSTRUCTION of this machine has undergone ſeveral alterations, and ſome few improvements may have been made in it; none of them, however, of moment; except that of changing the materials of the ſails, from boards to ſheet iron. Its complexneſs is the only bar to its popularity. Should a happy ſimplification of it be hit upon, it will doubtleſs be received into univerſal practice.

The preſent *price* is about five guineas.

Its *uſes* will be ſpoken of, under BARN MANAGEMENT.

THE

6.

THE WEATHER.

THE BAROMETER, here, as in other places, has its advocates and its revilers. But neither of them appear to view it in its true light. The former ſpeak well of it, becauſe it has more than once ſaved their hay or their corn from damage: the latter revile, or perhaps break it, becauſe they have been caught in the rain, when the *weather-glaſs* was above *changeable:* expecting that the *glaſs* ſhould indicate the weather, with the ſame preciſion, that a clock or a watch ſhows the time of the day.

But this is ſomewhat unreaſonable: it would, indeed, be equally philoſophical to quarrel with the ſcales, when the guinea is under weight. It is quarrelling with the laws of nature, not with a glaſs tube and quickſilver.

All that the barometer pretends to is, to aſcertain the WEIGHT OF THE ATMOSPHERE; which it does with great delicacy and

and accuracy: it is beyond the power of *mechaniſm* to form ſo fine a balance.

To the improper tables of the Jews, and *other* makers (who ought to have judged better), we muſt aſcribe thoſe diſappointments which have brought their inſtrument into undeſerved diſrepute. If inſtead of *fair*, *rain*, and *changeable*, they had ſubſtituted *heavy*, *light*, and *medium*, or merely a ſcale of degrees, the barometer would have been conſidered, what it really is, a balance for aſcertaining the weight of the atmoſphere; not, what it never was or can be, *in itſelf*, an infallible prognoſticator of the weather.

In a former work *, I digeſted my ideas on this ſubject, fully, and circumſpectly. It is now more than ſeven years ſince that work was written; during which period I have continued to pay, in the ſummer months of almoſt every year, ſtrict attention to the weather. My ſucceſs has been *almoſt uniform*; much beyond any thing my expectation could have ſuggeſted.

My THEORY and PRACTICE ſtill remain unchanged. The SETTING SUN and the BARO-

* EXPERIMENTS and OBSERVATIONS concerning AGRICULTURE and the WEATHER.

BAROMETER, taken *jointly, not ſeparately*, have been my *chief* dependance: other APPEARANCES, the WIND, and the HEAT of the atmoſphere have, in doubtful caſes, lent their aſſiſtance.

What I mean to ſay further on the ſubject, at preſent, is, to recommend to every man, concerned in matters of huſbandry, to pay due attention to the weather. I know from my own experience (even though I may have been in ſome degree *fortunate*), that much may be ſaved by it.

He muſt not, however, expect that a foreknowledge of the weather is readily learnt: like holding the plow, and judging the quality of ſtock, it requires conſiderable PRACTICE.

In haytime and harveſt, let him give an eye to atmoſpherical appearances, and attend to the ſetting ſun, as a *buſineſs* of the firſt importance; and let him conſider his barometer, as a *uſeful implement of huſbandry*.

In the courſe of a few ſummers, he will find himſelf enabled to foreſee the weather, with the ſame kind of PRACTICAL KNOWLEDGE, as that which tells him what hay is fit for the ſtack, and which bullock will pay beſt for grazing.

The

The PROGRESS OF SPRING, 1787, at Pickering, Yorkshire.

The gooseberry foliated,—10 March.
The sallow in full blow,—5 April.
One swallow, near water,—12 April.
The Hawthorn foliated,—18 April.
Swallows about houses,—27 April.
Cuckow first heard,—6 May.
Swifts,—12 May.
Oak foliated,—29 May.
Hawthorn blowed, 10 June.
Ash foliated,—11 June.

During May, cold pinching winds; and, in the beginning of June, a very smart frost.

QUERY, Do these circumstances account for the unusual difference in the time of foliation of the oak and the ash, and the blowing of the hawthorn; which, in a common year, happen within a few days of each other? The roots of the oak lie low; those of the ash and hawthorn, superficially.

In June, heavy rains set in; and continued, almost without intermission, until December. So wet a summer has seldom—perhaps scarcely ever—happened. Hay, in general, was spoilt; and thousands of acres of corn were little less than wasted in the field! a circumstance, perhaps, entirely new in the annals

annals of husbandry. I never before knew a season, which did not afford a time (to those who had patience to wait for it,) for harvesting hay and corn, in *tolerable* condition. But this year, the late-ripe crops upon the Wolds, the Northern Heights, and in the Morelands, were, *inevitably*, little less than lost. During the latter harvest there were not, I believe, two fair days together, until near Christmas! the corn, which was carried, was of course spoilt, in the stack or mow. Hogs were bought up, and turned loose among the sheaves in the field! *

Another remarkable circumstance of this season was the extraordinary STRENGTH OF VEGETATION; which was equally manifest in the garden and the field. Every thing was *out of size:* Some plants entirely disfigured. Pasture grounds overrun with stale grass. In some stinted pastures (grounds let out annually in cowgaits to a fixt number of cows) scarcely half the grass was eaten.

These extraordinary exertions of vegetation are, perhaps, to be accounted for, in a succession of dry summers, terminating in a moist

* Yorkshire was not singular, in this disaster. All the Northern counties, I believe, shared a similar fate.

moiſt one. The ſoil, unable to exert itſelf during the dry ſeaſons, became furniſhed with extraordinary powers; to which the moiſtneſs of this ſummer gave full ſcope.

7.

PLAN OF MANAGEMENT OF FARMS.

I. The HISTORY of FARM LANDS.

The huſbandry of the Vale, like that of many other Diſtricts, has undergone a total change by INCLOSURE.

Formerly, the entire margin, and much of the bottom of the Vale, lay in open COMMON FIELD; ſubject, from time immemorial, to the round of

Wheat, barley, or big.
Oats, beans, or other pulſe.
Fallow.

Above theſe fields, were extenſive COMMON SHEEP WALKS; below them, COMMON PASTURES,

TURES, for cattle and horſes; and COMMON MEADOWS, for hay.

Under this ancient ſyſtem of management, the produce of the Diſtrict was ſmall; the fields were unproductive, by inceſſant plowing, and for want of a change of crops; and the meadows, by being mown, year after year, without remiſſion, and without any other melioration, than what chance floods might partially afford them: while the paſture grounds, overrun with buſhes and weeds, were equally unproductive. The principal part of the entire produce went to the maintenance of the oxen and horſes, employed in the cultivation of the fields. Even the yeomanry, with all their induſtry and frugality, ſtarved on their own eſtates, well ſoiled as many of them naturally were.

The Incloſures, which have taken place within the preſent century (ſee the Art. INCLOSURES) have not only changed the ſyſtem of management, and increaſed the *neat* produce of the Diſtrict, perhaps *threefold*; but have inverted, in a remarkable manner, the *comparative* value of lands.

Formerly, the meadow lands were generally eſteemed the moſt valuable part of a townſhip: there have been inſtances of theſe lands,

cold-ſoiled, wet, diſtantly ſituated, and unproductive, being exchanged for common-field lands; which, *at preſent*, being naturally well ſoiled, ſituated near a town, now incloſed, and laid down to graſs, are of *five* times the value of the old graſsland; ſome of which ſtill lies, in an intermixed unimproved ſtate.

This is the moſt ſtriking proof, I have met with, of much being to be done, *in ſome caſes*, by a CHANGE OF GENERAL MANAGEMENT.

This extraordinary improvement has not been effected, by the mere circumſtance of Incloſure; but principally by that of changing OLD ARABLE LANDS TO GRASS, AND OLD PASTURE LANDS TO ARABLE. A change which ſeldom fails, if properly made, of being highly beneficial to the OCCUPIER; and is frequently, as in this caſe, permanently beneficial to an ESTATE.

The *ancient* ſyſtem of management being now nearly extinct,—and no circumſtance of it, except the extreme induſtry and frugality with which it was conducted, being worth preſervation,—I ſhall proceed to conſider the Vale as an INCLOSED COUNTRY, and deſcribe its PRESENT GENERAL MANAGEMENT: together with the various IMPROVEMENTS, which

which have been made in it, during the laſt twenty or thirty years.

II. The primary OBJECT of the Vale Huſbandry is

BUTTER;

put down into firkins; the beſt of it for the London market; the inferior ſorts for the manufacturing towns of Weſt Yorkſhire.

Cows, barren, or in calf;

OXEN, and ſome few younger cattle; and

HORSES, principally for the ſaddle, —— have long been ſtaple productions of the Vale; and are annually ſent out of it, in conſiderable numbers, principally to the ſouthern markets. Some

BULLOCKS, and great quantities of

SHEEP, are fatted, in the Vale and Morelands, for the ports of Whitby and Scarborough. Of late years,

BACON has been ſent, in conſiderable quantity, into the Weſt of Yorkſhire, and ſome to the London market.

RABBITS are not a ſtaple article, in the Vale, or on its margins, though ſome good warrens occur.

With reſpect to vegetable produce,

RAPE

may be conſidered as that which brings moſt

money into the country. Since the incloſure of common paſtures great quantities of

OATS

have been ſent out of the Vale. Alſo ſome ſmaller parcels of

BARLEY and
PULSE

have of late years been ſent down the Derwent. But, notwithſtanding the goodneſs of the ſoil, and its fitneſs for

WHEAT,

very little of this grain has been carried out of the neighbourhood of its growth; having been wholly uſed in the home conſumption. Of late years, however, there has been an overflow; and Whitby has drawn part of its ſupply, from hence.

Beſides theſe articles of MARKET PRODUCE, a variety of *ſubordinate crops* are raiſed; as

GRASS, or NATURAL HERBAGE;

CLOVER, and other CULTIVATED HERBAGE;

TURNEPS, for cattle and ſheep;

POTATOES, for cattle and ſwine: alſo

FLAX (manufactured in the Vale);

TOBACCO.

III. The

III. The COURSE OF PRACTICE. No regular ſucceſſion, of arable crops and fallow, can be traced, in this Diſtrict. Every man follows the dictates of his own judgment, and ſubjects his arable land to ſuch uſes, as are beſt ſuited to the general economy of his farm, in the given year.

This mode of management is not peculiar to the Vale under obſervation, but is common to other Diſtricts, in which GRASS-LAND predominates; under which circumſtance, *aration* is conſidered as a ſecondary, and in moſt caſes a *ſubordinate* branch of management.

When the ſward becomes unproductive, it is delivered over to the plow, and the ſoil kept in an arable ſtate, until another piece of ſward begins to fail; when the former is laid down again to graſs, and the latter broke up for arable.

In the Midland counties, where this alternacy of graſs and corn has, in ſome inſtances, been in practice time immemorial, a regular courſe of huſbandry has taken place. But, here, where this ſyſtem of management is in its infancy, and where the diverſity of ſoils is almoſt endleſs, no regular round of ma-

nagement can, with propriety, be at preſent purſued.

Land which has been kept in TILLAGE, century after century, is prone to graſs, and will *retain its ſward*, much longer, than land which has been, only a few years, under the plow. And a RICH SOIL, COOLLY SITUATED, will *retain its ſward*, much longer, than thin-ſoiled upland.

There are numberleſs inſtances, in which the richer cooler parts of the early incloſed common-field lands have now lain, more than *half a century*, in GRASS: nevertheleſs, the *ſward*, though perhaps mown year after year, and treated with no extraordinary care, *ſtill remains unimpaired:* the herbage well ſorted, and the produce ample.

Therefore, to ſubject the lands of this Diſtrict, circumſtanced as they are, *at preſent*, to any METHODICAL ARRANGEMENT, or REGULAR ROUND OF CROPS, would be an evident impropriety.

The only particular of the management of the Vale, in this reſpect, which appears to me cenſurable, is that of ſuffering *thin-ſoiled thirſty upland* to lie in a ſtate of *ſward*, perhaps as "meadow" (mowing ground,) when it

it would, I apprehend, pay much better, in a courſe of ARABLE MANAGEMENT. Turneps, barley, wheat, and the cultivated graſſes, equally affect it.

8.

SOILS

AND THEIR

MANAGEMENT.

THIS COMPLEX ſubject requires, in the preſent inſtance, the following arrangement.

1. Species of ſoil.
2. Subſoils and underdraining.
3. Rough grounds and clearing.
4. Tillage.

I. SPECIES OF SOIL. The great diverſity of ſoils, which the Vale and its environs afford, has been mentioned. Viewed in this light, it is a ſpecimen of country which admits not, perhaps, of compariſon. Within the narrow limits of a few miles, BARREN HEATH and LOW FEN LANDS are included; with

almoſt every intermediate ſoil: unproductive GRITSTONE LAND; thin ſtapled LIME-STONE LOAM; deeper and more productive "REDSTONE LAND*;" rich deep PEBBLY LOAM†; ſtrong blue CLAY. And what renders this circumſtance ſtill more remarkable, there are inſtances in which the ſeveral ſpecies of ſoils, here enumerated, are included within the ſame farm.

A farm,

* RED-STONE LAND.—This ſingular ſpecies of ſoil is compoſed of loams, of different qualities, intermixed with a greater or leſs quantity of ſoft ſandy ſtones, about the ordinary ſize of flints, and of a dark yellow or orange colour; a ſpecies of grit, or freeſtone. The cultivated ſoil is, in ſome inſtances, nearly half of it made up of theſe ſtones; which, ſome men are of opinion, afford, in themſelves, a degree of nutriment to corn crops. An inſtance is mentioned (of this as of other ſtoney ſoils), in which a great quantity of theſe ſtones having been gathered off, as an incumbrance to the ſoil, its productiveneſs was much lowered; but the ſtones being returned, the ſoil alſo returned to its former ſtate of fertility. Be this as it may, the ſoil under notice is, beyond diſpute, one of the fineſt *corn* ſoils in the iſland.

† PEBBLY LOAM. This ſoil is noticed, as being the moſt *uſeful* ſoil, taken all in all, I have any where yet obſerved. It is equally productive of *corn* or *graſs*; may be worked as *arable land*, in any ſeaſon; and is ſound enough, in *graſs*, to bear ſtock in winter. I particularize theſe ſoils, as they may, hereafter, with a variety of others, form a ſeparate ſubject of inveſtigation.

A farm, thus variouſly ſoiled, is a ſpur to ingenuity; obliging its occupier to break through thoſe confined opinions, and narrow prejudices, which are too frequently contracted, in countries where a UNIFORMITY OF SOIL, and a REGULAR ROUTINE OF MANAGEMENT, prevail.

This may account, in ſome meaſure, for the SPIRIT OF IMPROVEMENT, ſo conſpicuous among the HUSBANDMEN of the country under ſurvey.

II. SUBSOILS. The FEET and SIDES OF HILLS generally abound in LANDSPRINGS, and COLD WET SUBSOILS, cauſed by the waters, abſorbed by the upper parts of the ſwells, lodging and ſtriving for vent, in the lower regions.

From the cloud of hills which riſe to the north of this Vale, it might be expected that a vein of cold land would be found on its margin; but obſervation proves the contrary.

The waters of the Morelands find vent, in the dales and dingles with which they are interſected, and are entirely cut off from the Vale, by a deep valley, which lies between the moreland ſwells, and the range of limeſtone heights that form the immediate banks of the Vale; while the heights, themſelves,

ſelves, being in all human probability formed entirely of fiſſured rock, receive into their boſoms the waters which their ſoils abſorb, and which ſink below their baſes, or riſe in rocky fountains at their feet.

Near Pickering, the RIVER COSTA takes its riſe; not guſhing forth, as from the mouth of a cavern, but riſing, at numberleſs apertures, through a filter of ſand, which has probably been brought out of the fiſſures of the rock; the entire river, or rather river-like brook, riſing within the compaſs of a few acres.

It is a fact worthy of attention, though perhaps eaſily to be accounted for, that a tract of country, containing about twenty ſquare miles, lying above this effluv, has ſcarcely another SPRING belonging to it, nor ſcarcely a perch of SPRINGY SOIL upon its ſurface.

The limeſtone and redſtone lands lie all on ROCK, above the level of this ſpring. The pebbly loam, which lies below it, is equally fortunate in a ſeam of GRAVEL, which, tho' it lie ſome feet beneath the ſurface, renders it ſufficiently dry to be worked, at all ſeaſons, and to carry ſtock, in winter, with impunity.

Under

Under theſe circumſtances UNDER-DRAINING is rendered uſeleſs; and no inſtance of it occurs in this neighbourhood, except in the improved peatbog, which was mentioned under the article PLANTING; and which lies in the immediate vicinity of the ſource of the Coſta; by whoſe waters, before the channel of the river was made, that bed of moor had been formed. The wetter parts of the area received conſiderable improvement from underdraining.

But altho' the ſubſtructure of the MARGIN is ſuch as to preclude the uſe of underdraining, that of the *ſwells*, which riſe in the BOTTOM OF THE VALE, renders this operation frequently neceſſary; and, in ſome few inſtances, it has been practiſed with great ſucceſs.

In the inſtance which I moſt particularly attended to, thirty acres of cold unproductive land, lying on the ſkirt of one of thoſe hillocks, was, by underdraining, improved to more than twice its former value. From a ſtate of ruſhy ill graſſed ſward, it was raiſed, firſt to a piece of productive corn land, and is, now, a ſound well herbaged grazing-ground. The MATERIALS, in this caſe, wood. No ſtones, in the neighbourhood.

In

In the MORELAND DALES, underdraining would, in many cafes, be a valuable improvement; and, there, *ftones* are abundant.

The *offal freeftones*, which lie an incumbrance to the quarries of the margin, would pay well for carriage, into the bottom of the Vale.

III. THE RECLAIMING OF ROUGH GROUNDS. The incloſures of COMMONS and WASTE LANDS, which have of late years taken place, have directed the attention of huſbandmen, toward the clearing and breaking up ſuch lands, for the purpoſes of AGRICULTURE.

1. SODBURNING. The practice which has gained the greateſt eſtimation is that of SODBURNING — provincially, "paring and burning:"—a practice which is little known in many parts of the iſland; but which ought to be well underſtood by every huſbandman in it.

1. *Paring.* The buſhes and other incumbrances of the ſurface being removed, the ſward is inverted, with the breaſt plow,—provincially, "paring ſpade,"—in ſods, about a foot wide, and three feet long.

The *judgment* requiſite, in this ſtage of the proceſs, lies chiefly in determining the proper

THICK-

THICKNESS of the ſods. If they be pared too thick, they are difficult to burn; if too thin, the ſward is not effectually deſtroyed, and the produce of aſhes is too ſmall. A rough ſpungy ſurface ought to be pared, thicker, than one which is firm and bare of graſs; and a light ſhallow ſoil ought to be pared, thinner, than one which is deeper and more tenacious. An inch may be conſidered as the medium thickneſs.

The *attention* required, in this part of the buſineſs, is principally to ſee that men, who work by the acre, break off the ſods at proper lengths, and clear them effectually at their outer edges.

The *price* ten to twelve ſhillings an acre, varying principally with the freeneſs of the ſoil. Roots are detrimental, but ſtones are the greateſt enemies, to the paring ſpade.

2. *Burning.* If the ſods be naked, and the ſeaſon moiſt, they are "ſet," on-edge, to dry; if graſſy, and the weather be fine, this labor may, with propriety, be ſpared.

The *method* of burning is, invariably, in *ſmall heaps* *, a rod or leſs aſunder, according to

* For the greater conveniency of burning the ſods, as well as of ſpreading the aſhes.

to the quantity of ſod; but the way of *forming the heaps* is not fixed.

The bottom is generally made, in a round form, about a yard in diameter, with ſods ſet on-edge. Some lay, on the windward ſide of this bottom, a bough of furze, or other kindling, with the bruſh end outward, covering it above with the graſſieſt and drieſt bits of ſod; and then make up the heap, in the form of a ſmall haycock; keeping the ſods, on the inſide, as hollow as may be; but laying them flat and cloſe, on the outſide, to keep in the heat.

The heaps, made in this manner, are kindled, with a bough of lighted furze,—or, which is better, a link, made of tow dipped in tar, and wound round a ſmall ſtake or other ſtick;—the lighter running along the rows, from heap to heap, ſetting fire to the kindling.

Others, having formed the bottom, as above deſcribed, carry up the heap, with a *chimney*, in the middle; kindling it with a ſhovelfull of live aſhes, thrown down the chimney. When kindling materials are ſcarce, this may be the more eligible method.

When the ſods are under-dry, much ſkill is requiſite in forming the heap. The art lies,

lies, chiefly, in keeping it light and hollow within; and, whether it be made with an *eye*, or a *chimney*, in having due regard to the windward ſide. A little practice, and proper attention, will readily ſupply the reſt.

If the heaps be made too large, at firſt, their own weight cruſhes them down, and deſtroys the neceſſary openneſs of the inner ſide; if too ſmall, the fire, not being ſufficiently confined, flies outward, and ſpends itſelf, prematurely.

The heaps well on fire, freſh ſods are laid on, from time to time, until the whole are expended; not more than half of them, perhaps, being uſed in forming the original heaps.

In "beating up" the heaps, the freſh ſods are laid upon the ſide, on which the fire is the ſtrongeſt; the addition being ſeldom made, until the fire begin to make its appearance, on the outer ſide of the heap.

When all the freſh ſods are expended, the unburnt pieces, which ſlide down the ſides of the heaps and lie round their ſkirts, are laid upon the top, and the whole reduced to aſhes, or at leaſt expoſed to the free action of the fire.

The

The burning is principally done, by women, by the day: ſometimes the paring and burning are let together, by the acre. The *price of burning* five to ſix ſhillings an acre.

3. *Aſhes.* The moſt general method, and that which ſeems to be in the beſt eſteem, is to ſpread the aſhes, as ſoon as they are cool, or perhaps while yet warm, and to plow the land, immediately, for the crop, with a *ſhallow furrow*, to prevent the aſhes from being buried too deep in the ſoil.

Sometimes the ſoil is only *rice balked*, or half plowed,—not plowed clean.

Perhaps the moſt effectual method of mixing the aſhes with the ſoil, the great thing to be deſired, would be, firſt, to rice-balk, acroſs the ridges; and, then, to gather them up, with a clean plowing.

This ſummer has afforded me an opportunity of obſerving a ſingular INNOVATION, in the art of ſodburning.

Inſtead of the ſods being dried and burnt, and the aſhes ſpread on the *pared ſurface*, and *plowed in*, under furrow, the land, in this inſtance, was plowed, immediately, as the paring was finiſhed, the ſods dried and burnt, and the aſhes ſpread upon the *plowed ſurface*,

to

to be harrowed in with the ſeed, as a *top-dreſſing*.

In executing this method, the ridges of the lands were cleared, five or ſix feet wide, by throwing back the ſods upon the ſides of the lands; and, as the ground was plowed, the ſods were returned to nearly their former ſituation; being thrown on, rough, over the plowed ground. One plow took about three women, at tenpence a day, to follow it. The extra *expence* half a crown to three ſhillings, an acre.

The *advantages* propoſed, by this novel practice, are theſe: firſt, that of ſecuring a burning ſeaſon, with a degree of certainty, and without the expence of "ſetting" the ſods; which being kept hollow, underneath, by the inequalities of the plowed ſurface, a free circulation of air is admitted, and the evil effect of regrowing to the ground, entirely prevented; and ſecondly, thoſe of mixing the aſhes more intimately and more evenly with the ſoil, and of preventing their being buried too deep, by the firſt plowing; which, in this inſtance, was neceſſarily given very deep, the ſoil being of a moory nature, and in a ſtate too tender and moiſt to be plowed with a ſhallow furrow; which would

not have laid the ſurface ſufficiently dry, for turneps,—the intended crop.

Therefore, in this caſe, the management was obviouſly judicious: and whether the advantages of FORWARDING THE DRYING, and of being able to uſe the aſhes as a TOP-DRESSING, may not render the practice generally eligible, can be aſcertained by experience, only.

4. The *time* of ſodburning depends upon the *ſeaſon* and the intended *crop*.

It is always unadviſeable to pare in a *wet ſeaſon*. The covering moiſt and feeble, and the ſods ſopt with wet, fall heavy and flat to the ground. The graſs ſoon rots; and if the ſeaſon continue moiſt, the roots will, in a little time, regain a footing in the ſoil.

On the contrary, ſods pared in *dry weather* fall light off the ſpade, and are kept hollow, underneath, by the graſs or other covering, which, in a dry ſeaſon, are rigid; bearing up the ſods from the ground; thereby admitting a circulation of air beneath them. By this means, the extra expence and trouble of *ſetting* is avoided, and the proceſs of cineration rendered much leſs difficult, and irkſome.

The CROP, therefore, ought to be, in ſome meaſure, ſubſervient to the SEASON.

5. *The*

5. *The crops* moſt in uſe, for ſodburnt lands, are WHEAT, RAPE, TURNEPS, BIG, OATS. It is ſeldom, however, that a paring ſeaſon can be got, early enough in the ſpring, for either of the latter crops; the laſt more eſpecially. Big, however, is frequently ſown on burnt land, the latter end of May, or the beginning of June, with ſucceſs. RAPE and TURNEPS are the moſt general crops, and upon the whole, perhaps, are the moſt eligible: the month of June is a leiſure time, and generally a good burning ſeaſon. However, WHEAT, provided the land were fallowed, and the ſoil and aſhes mixed together, by repeated plowings and harrowings, between the burning ſeaſon and ſeedtime, does not appear to be an ineligible crop.

There have been inſtances, I am told, in which the aſhes (having been ſpread in the middle of ſummer) were ſuffered to be grown over with graſs; which being turned under in autumn, WHEAT has been ſown on one plowing, with good ſucceſs *.

GENERAL OBSERVATIONS. SODBURNING appears to be one of the ſources of improvement,

* 1796. This is, in theory, a moſt eligible practice; and is entitled to full attention, on breaking up old rough graſs lands.

ment, which, being yet imperfectly underſtood, require every effort of the farmer and the philoſopher, to bring them nearer to perfection.

At preſent, the practice is confined to a few Diſtricts: and in thoſe it is applied to particular purpoſes, only: while the principal part of the kingdom is a ſtranger to its uſes.

It does not appear to be conſidered, even in this Diſtrict, as a GENERAL SOURCE OF MANURE; but, merely, as being applicable to the reduction of *old tough ſward*.

For even here, where it has long been in common practice among diſcerning huſbandmen, there are men who ſtill ſee it as a bugbear, too terrible to become familiar with. The falſe notion of "ſending the ſoil into the clouds," frightens ſome; while the better-founded idea of reducing it all to aſhes—by too frequent repetition of this operation—is a ſtumbling block to others.

Whoever will attend to the quantity of earth in the ſods, and the quantity of aſhes produced from them, will loſe his fears about the *ſoil* being *leſſened* by this operation.

Suppoſing the ſod to be an inch thick; not more than one fourth of it, perhaps, is

ſoil;

ſoil; and this, ſo far from being *reduced* in bulk, to an alarming degree, is perhaps *increaſed* in ſize, by the action of the fire; which, by leaving it, in an open porous ſtate, renders it *more bulky*, than the ſame ſoil, ſhook from the ſods and reduced to a perfect ſtate of dryneſs only, would *probably* have been.

I will not contend for the *increaſe*, nor will I, at preſent, admit that the ſoil is *leſſened*, by the operation. Different ſoils are acted upon in different ways, by fire: CLAY burns to *hard cinders*, of the nature of *brick*, remaining in the ſoil, *unaltered by time*; while the cinders of lighter ſoils are more periſhable.

Theſe effects of ſodburning do not appear to have been attended to. Its uſe in reducing tough ſward ſtrikes every one; and its effect, as a manure, in the caſes in which it is uſually applied, is here clearly underſtood.

But its effect, in IMPROVING THE CONTEXTURE OF STRONG COHESIVE SOILS, has eſcaped general notice. Yet how could art deviſe an ingredient more likely to give openneſs, and freedom, to a cloſely textured ſoil, than rough, porous, unperiſhable aſhes? a material of improvement which the ſoil itſelf ſupplies, free of coſt. The *immediate* ac-

quiſition of MANURE repays the expence of the operation. The more PERMANENT IMPROVEMENT of the CONTEXTURE of the SOIL is obtained, of courſe, without expence.

Viewed in this light, SODBURNING, whatever effects it may have, on light porous ſoils, is, in all human probability, a cardinal improvement of ſoils, of a CLOSE CLAYEY NATURE: and it appears to me a matter incumbent, on every poſſeſſor of ſuch ſoils, to try, on a ſmall ſcale at leaſt, the effect of a FREQUENT REPETITION of this operation.

2. FURZE GROUNDS. It is the opinion of one, who has paid cloſe attention to the ſubject, that *old furze grounds*, off which fuel having been repeatedly carried, are of courſe much depauperated, may be improved in the following manner.

Grub up; ſow graſs ſeeds, on the grubbed ſurface, without plowing; and let the land remain in this ſtate, until it has acquired a degree of firmneſs, the ſmaller roots left in it are decayed, and the ſurface has got a covering. Then ſodburn, lime, &c. and break up the ſoil, for a courſe of arable crops; cloſing with cultivated herbage. When the furzes begin again to grow troubleſome, repeat the ſodburning.

3. WOOD-

3. WOODLANDS. The ſame inventive huſbandman has ſtruck out a ſimple and certain method of freeing graſs land from the SLOETHORN, — one of the hardieſt *ſhrubs* which huſbandry has to contend with.

If black thorns be *grubbed up by the roots*, every fibril, left in the ſoil, produces a freſh plant; ſo that, inſtead of being leſſened, by this tedious and expenſive operation, their number is encreaſed.

If they be *felled, aboveground*, the ſtubs are in the way of the ſithe, and the bite of cattle; and the thicket is preſently renewed.

But if they be CUT OFF LEVEL WITH THE SURFACE (or ſomewhat beneath it), the ſithe has free ſweep, and the young ſhoots are of courſe removed, with eaſe and certainty.

If the ground be mown for hay, the ſame ſtroke, which cuts the herbage, takes off the ligneous ſhoots.

If paſtured, cattle and ſheep, provided they have no *woodland* left to brouze among, will gnaw them to the quick; ſcarcely leaving a ſtem or a ſtump remaining. It is, however, always adviſeable, in *this* caſe, to ſweep the ground over with the ſithe, in the courſe of the ſummer ſeaſon; to remove, effectually,

the remains which may have eſcaped the bite of the paſturing ſtock.

The ſecond year, the *ſhoots* riſe weak; and the *roots*, themſelves, ſeldom ſurvive the third year. In a very few years more, the roots are found entirely rotten; thus becoming a ſource of nutriment to the crop, inſtead of remaining a nuiſance.

If a thicket, or a border, whoſe *ſward* is nearly loſt, be treated in this manner, rubbiſh of every kind ſhould be raked off, a few GRASS SEEDS ſcattered on, and the ſurface run over with a roller, as a preparation for the ſithe.

This mode of extirpation is not applicable to the SLOE THORN, only; but to the OAK, the ASH, the HAWTHORN, the MAPLE, and every other tree and ſhrub, to which it has been applied,—the FURZE and the BRAMBLE excepted.

GEN. OBSERVATIONS ON RECLAIMING FOREST LANDS. It is, I believe, a univerſal practice, when WOODLAND is given up to HUSBANDRY, to take up *all the roots*, large or ſmall, at an expence, perhaps, equal to half the value of the land; which, in this caſe, is ſubjected immediately to the *plow*: altogether, the moſt rugged operation, which huſbandry is acquainted with.

But

But how much more eligible would it be, to treat ſuch land, in the manner above deſcribed? keeping it in a ſtate of GRASS, until the *roots were decayed*, and rendered obedient to the ſhare.

The ſums of money (one might ſay the fortunes), which have lately been expended, in the IMPROVEMENT of ENFIELD CHACE, are too well known; and will, it is to be feared, throw a damp on the further improvement of the ROYAL WASTES: a concern of ſome importance to theſe kingdoms.

But how eaſily, and with what certainty, might theſe waſtes be improved? The WOOD, upon moſt of them, is doubly ſufficient to make the neceſſary improvement.

Take down the TIMBER TREES, and the POLLARDS, by grub-felling, in the Norfolk manner: remove ſuch of the LARGER ROOTS as will pay amply for removing; and fill up the holes, with the cores of ant-hill, or other protuberances, with which theſe waſtes generally abound; ſowing graſs ſeeds on the ſurface.

Treat the UNDERWOOD, and other BRUSH WOOD in the manner above deſcribed; and reduce the whole to a ſtate of GRASS; keeping it carefully ſwept with the ſithe, until the

the REMAINING ROOTS be SUFFICIENTLY DECAYED.

Then, *but not before*, bring the ſoil under a courſe of ARABLE MANAGEMENT.

The fencing, the caſtration of ant-hills *, and perhaps doing away a few other roughneſſes, would be the only labor requiſite, which would not more than repay itſelf †.

The ROOTS, inſtead of being a principal cauſe of EXPENCE and ANXIETY, would, under this management, become a ſource of IMPROVEMENT OF THE SOIL; while the EXPENCE, of bringing the ſoil under a courſe of ARABLE MANAGEMENT, would be in a manner precluded, by having a *free graſſy ſurface*, ſuitable to the purpoſe of SODBURNING.

This townſhip (part of the ancient foreſt of Pickering) affords at preſent (Auguſt 1787) numberleſs inſtances of the great UTILITY of SODBURNING MAIDEN SWARD.

In adjoining allotments (ſee the Art. INCLOSURES) without a ſhade of difference, as to ſoil or ſituation, the crop, after ſodburning, is, in ſome inſtances, *fourfold* that of the crop, ſown

* See NORF. ECON. MIN. 50.

† If DRAINING be found requiſite, how ſuitable is the opportunity, while land remains in graſs.

ſown on one plowing of the natural ſward; and this notwithſtanding the favorableneſs of the preſent ſummer, towards the latter proceſs. Had the ſeaſon proved *dry*, oats ſown on one plowing of the *thinner ſoils*, muſt have periſhed; or, at beſt, muſt have remained in a dwarfiſh unharveſtable ſtate. There are oats, even this year, not ſix inches high; and others, too weak and ſtraggling to ripen as a crop, have been ſwept down with the ſithe, and raked together, as fodder.

It is obſervable, however, that, on the *deeper ſoils*, there are, this year, ſome fine crops of oats, on the natural ſward.

The cauſe of this diſparity, between the produce of deep and ſhallow ſoils, is obvious. The ſurface of ſoils which have remained, from century to century, in a ſtate of SWARD, is, in a manner wholly, occupied by the roots of graſſes and other plants; forming a *tough mat of fibres*; reaching, in ſome caſes, ſeveral inches deep; eſpecially over a cold moiſt ſubſoil; where the ſedgy tribe are frequently in full poſſeſſion.

If the SOIL be THIN, it is *wholly occupied by roots:* the plits, or plow ſlices, afford *no looſe mold*, for covering the ſeed; which either lies expoſed on the ſurface, or falls through

through the ſeams, upon an infertile ſubſoil, and among graſs, ſtill perhaps in a growing ſtate. The few grains, which happen to get buried in the mold, flouriſh, while their own ſubſtance laſts; but the kernel once exhauſted, the rootlings look out, in vain, for other ſuſtenance; the ſoil is already occupied, by veteran roots, too powerful for the infant fibrils to contend with.

But, if the SOIL be DEEPER THAN THE SWARD, the ſeeds get properly covered, and the young plants have freſh mold to ſtrike root in; and to ſupport them, until the ſward die, decay, and afford nouriſhment to the riſing crop.

The USES OF SODBURNING, *thick-ſwarded ſoils*, are thoſe of effectually *killing the ſward*; doing away the *toughneſs of the plits*, and furniſhing, in the aſhes, a ſupply of acceptable *pabulum* to the infant plants.

Out of this ſtatement of effects reſult theſe general concluſions.

RICH, DEEP SOILS, though covered with old ſward, may be ſown with corn, on ONE PLOWING.

It is reaſonable, however, that this plowing ſhould be given, ſome time before the ſeed be ſown; for the double purpoſe of expoſing

poſing the inverted plow ſlices to the meliorating influence of the ſun and air, from which they may have long been eſtranged; and of FORWARDING THE DIGESTION OF THE SWARD.

It is likewiſe obſervable, that, in this caſe, a DOUBLE PLOWING (burying the ſod at the bottom of the furrow) is obviouſly preferable to a ſingle one.

But SHALLOW, LESS FERTILE SOILS will not bear this treatment: they require either to be SODBURNT, or FALLOWED, to reduce the ſward and meliorate the ſoil.

But fallowing is expenſive, loſes, *unneceſſarily*, one year's crop, and does not change the texture of COHESIVE SOIL; to which, whether deep or ſhallow, ſodburning appears to be ſingularly well adapted.

The length of theſe reflections will, I truſt, find an excuſe, in the magnitude of the ſubject which gives riſe to them. The ROYAL FORESTS, and numberleſs PAROCHIAL WASTES, afford at preſent little benefit to the community; but are capable of affording great national advantage. To endeavour to forward their improvement, by pointing out the eaſieſt method of accompliſhing it, is, therefore, the duty of every man, whoſe experience

experience has led him to reflections on the ſubject.

Improvements, thus conducted, would be progreſſive and pleaſurable; requiring no extraordinary ſhare, either of attention or capital.

IV. TILLAGE. In a country in which GRASS LAND is the PRIMARY OBJECT, excellency in the minutiæ of the ARABLE PROCESSES muſt not be expected: nevertheleſs, where the invention is let looſe, and a ſpirit of improvement prevails, we may hope to find ſome SPECIAL MATTER worthy of notice.

The only particulars, which appear to me noticeable, in this place, are,

1. Plowing with reins,
2. Laying lands acroſs ſlopes.

1. PLOWING WITH REINS. In this reſpect, the huſbandmen of the Vale excel. Various as are their ſoils, they plow them, invariably, with TWO HORSES, driven and guided with REINS; which at once anſwer the purpoſe of *guiding* and *driving*: thus far exceeding the leſs handy line, and the hand whip of Norfolk *!

Proper

* See NORFOLK; Section IMPLEMENTS.

Proper *ſeaſons* for the operation are endeavored to be caught; but, even with this advantage, it is matter of aſtoniſhment, how ſome of their ſtrong deep ſoils are turned, by a pair of light ſlender horſes; which, in a balance, would barely outweigh one of the four (or perhaps ſix) which are uſed upon the hills of Surrey and Kent, in plowing ſoils of leſs tenacity!

In Norfolk, the ſoil is light, and the great merit of the Norfolk huſbandmen lies in their expedition. Here, where the cuſtom is to go only *one journey*, the quantity plowed, in a day, is much leſs than in Norfolk; but generally more, even in the ſtronger ſoils, than is done by two men and four expenſive horſes, in many other places.

It has been a generally received idea, even among men who think liberally, and are inclined to think well of the practice of plowing with a pair of horſes, that it is only applicable to LIGHT THIN SOILS. But the eſtabliſhed huſbandry of this country proves that idea to be erroneous.

It ſtrikes me, however, advocate as I am for the practice, that, in ſome caſes, eſpecially where the ſoil is DEEP AND TENDER, three horſes, at length, would be preferable.

But

But the plea held out againſt this management is, "We cannot afford it"! The truth is, land here has got up to the TWO-HORSE-PLOW PRICE; and tenants ſeem to be aware, that they cannot pay their rents, if they ſend more than two horſes and one man to plow. What a ſtrong recommendation is this of the practice.

2. LAYING LANDS ACROSS THE SLOPES OF HILLS. The general practice, unleſs where the turnwreſt plow is in uſe, is to plow the ſides of hills, *up-and-down*, laying the lands parallel with the line of deſcent, not obliquely acroſs it *.

Where the SUBSOIL is *abſorbent*, this is perhaps the moſt eligible method; the rain-water which falls on the land being, by this means, effectually prevented from making its eſcape, off the ſide of the hill. For, unleſs *ridges* be raiſed very high, the water, in this caſe, has no propenſity toward the furrows, on either ſide; its tendency, when the *lands* lie flat, being down lines lying parallel between them: conſequently, the rain water, which falls upon them, may run from the top to the bottom of the hill, without finding its

* But ſee the WEST OF ENGLAND;—Section WHEAT.

its way into the *interfurrows*; which, in this caſe, are rendered *entirely uſeleſs*; as SURFACE DRAINS.

This circumſtance renders the common method of plowing the ſides of hills altogether ineligible, where the SUBSOIL is *cold* and *retentive*; and where the SURFACE WATER is of courſe required to be got rid of, the *quickeſt* and *ſhorteſt* way.

To this end, the lands are thrown ACROSS THE SLOPE, *nearly* parallel with the horizon, merely giving *ſufficient deſcent*, for water to find its way along the interfurrows.

The EFFECT of laying the lands in this direction is evident: the rain water, which falls upon them, has never farther to run, than the width of the bed it falls on; (even ſuppoſing it to fall on the upper edge) for ſo ſoon as it is caught by an interfurrow, the vegetable paſture is relieved from it.

Hence, the narrower the lands, provided the interfurrows be ſufficiently deep, the more immediate the effect.

The only INCONVENIENCY, of laying lands acroſs the ſlope, is that of having the *plits*, on the lower ſides of the lands, *to turn againſt the hill*; an operation which requires a good workman to do it properly.

But there is an ADVANTAGE, in this method, which more than overbalances that inconveniency. The PULL is always upon, or nearly upon, LEVEL GROUND; whereas, in the common direction of the lands, the uphill pull is intolerable to the beasts of draught, especially to horses; which, through fear or impatience, draw by jerks, eager to reach the top of the hill; thereby fatiguing themselves and the plowman, unnecessarily, and rendering the work defective.

The good effect of laying lands across slopes, is not only plausible, in theory, but is verified, by practice. I have seen an instance, in which land, which had heretofore been cold and poachy, improved, merely by changing the direction of the ridges, to DRY, SOUND, PRODUCTIVE soil, worth nearly twice the rent, it was, before this simple alteration took place.

MANURES

9.

MANURES

AND THEIR

MANAGEMENT.

THE SPECIES OF MANURE that are uſed in the Diſtrict are,

1. Aſhes.
2. Marl.
3. Lime.
4. Dung.

I. ASHES are uſed, chiefly, in the MORELANDS, where great quantities of turf and peat are burnt upon the hearth, for the double purpoſe of FUEL and MANURE; the aſhes being conſidered, as equivalent to the expence of collecting the materials.

II. MARL. This is not found, in quantity, *as a foſſil*, either in the Vale or the Morelands. The only marl, which has been uſed as a manure, is a produce of *petrifaction*. This marl, and the fountain from whence it flows, are noticeable.

The waters of "NEWTON-DALE-WELL" have long been celebrated, for their virtues in cold-bathing; and, for ſtrengthening the limbs of children, they are, I believe, celebrated juſtly. An anniverſary, relative to theſe waters, has been obſerved, time immemorial; and is ſtill obſerved, by the neighbouring youth, who meet at this ſpring, upon ſome certain Sunday in the ſummer months, to bathe; and—a poetic mind would add,—to celebrate the virtues of the water.

The ſituation of this ſpring is ſingularly wild and romantic: the country, on every ſide, mountainous and barren, excepting the narrow dale, or cultivated chaſm, near the head of which the ſpring is ſituated.

At the time theſe mountains and this chaſm were formed, the water, it is probable, guſhed out of the face of a perpendicular rock, which now riſes about eighty feet above the ſpring; but, through the mouldering of the rock, and the accumulative effect of the waters, the baſe of the precipice, out of which they iſſue, now reaches, with a ſharp aſcent, to near the mouth of the ſpring.

The upper part of the ſlope, at leaſt, has evidently been raiſed, by VEGETATION and PETRIFACTION. Had not the hand of art been

been aſſiſting in removing, from time to time, the accumulated matter, in the form of "marl" and "limeſtone," and in leading the water by a channel from the rock, the ſpring might, long ſince, by overgrowing its mouth, have been the cauſe of its own extinction.

Theſe waters, at their ſource, are remarkably cold, and ſtrongly CHALYBEATE to the taſte, tinging their bed of a deep ruſt color; but, as they fall down the baſe of the hill, they loſe, by degrees, their chalybeate qualities; loſing them, entirely, before they reach the foot of the ſlope.

What is equally obſervable, their PETRIFACTIVE quality is, at the ſource, barely perceptible, and does not acquire its full effect, until they have run ſome twenty or thirty yards down the ſlope; about which point, they loſe, almoſt entirely, their chalybeate *taſte*; though they ſtill continue to *tinge* the channel; the color growing fainter, as the length of channel increaſes *.

Where the rill meets with no vegetable matter, to petrify (or rather to *incruſt*), it

 forms

* This ſpring, which is at leaſt an object of curioſity, and whoſe waters may contain medical virtues which require to be pointed out, is ſituated about two miles from *Saltergait-inn*, on the road between PICKERING and WHITBY.

forms an INCRUSTATION, at the bottom of its channel; which, in time, being filled to the brim, the waters overflow, ſpread over the ſlope, and incruſt every thing which falls in their way; until having found ſome hollow channel (or perhaps in a ſtate of nature having reached the face of the rock), they form a freſh rill; which being annihilated, in the ſame manner, the waters proceed, and return, along the face of the ſlope; thus forming, in an undiſturbed ſtate, a natural ſemi-cone.

Where the ſurface has been free from moſs, or other vegetable production, the accumulated matter is WHOLLY CALCAREOUS; of a light colour, reſembling the MARL OF NORFOLK; except in its being diſcoloured, more or leſs, with a chalybeat tinge. Where moſs, liverwort, and other vegetables have been incruſted, a STONE-LIKE SUBSTANCE is formed: the former is called "marl,"—the latter "ſtone."

At preſent, the face of the ſlope is hollowed out, into great irregularity, by digging for, and carrying away the *marl*; leaving maſſes of *ſtone*, ſome of them containing many cubical feet, ſtanding above the preſent ſurface.

Theſe

Theſe ſtones, though light, being full of hollowneſſes within—mere bundles of moſs and algæ—have, by being long expoſed on the ſurface, acquired a very great degree of hardneſs; their ſmalleſt aſperities being with difficulty broken off.

By immerging the fragments in the marine acid, weakly diluted, the calcareous incruſtation is leiſurely diſſolved; leaving the vegetable matter, entire, and, to appearance, as perfect as when it was firſt incruſted; tho' it may have lain, locked up in that ſtate, a thouſand, or many thouſand years.

Theſe *vegetable ſtones*, likewiſe, have been carried away, and burnt as LIMESTONE. The quantity of *lime*, however, produced from them could not be great; but mixed with the *aſhes* of the vegetables, a valuable manure may nevertheleſs be formed.

In a ſituation ſo recluſe, it is no wonder this valuable ſource of manure ſhould have been, in ſome degree, neglected. The bottom of the dale which winds below it, does not appear to have been much benefited, either by the waters, themſelves, or the matter which they have formed. The principal part, of that which has been taken away, has been carried, up a winding road, over the top

of the mountain, to a neighbouring dale (Goadland) ſome three or four miles diſtant.

Over and above the difficulty and expence of carriage, a ſhilling a load has been paid, to the leſſee of the royalty, for theſe calcareous ſubſtances; not for the purpoſe of experiment, but in purſuance of eſtabliſhed practice; a ſufficient evidence, this, of their virtue as a MANURE.

III. LIME. This is, at preſent, a favorite Manure, in the Vale. It is uſed invariably, I believe, on every ſpecies of ſoil, and *in moſt caſes* with great ſucceſs. It ſeems to be, at preſent, a received idea, that the buſineſs of aration could not be carried on, or at leaſt that the preſent rents of land could not be paid, without the aſſiſtance of lime.

It is not my intention to attempt to prove, or diſprove, the truth of this opinion. Suffice it for me to ſay, in this place, that I am not acquainted with any country, in which lime is held in ſuch high repute, nor where the manufacturing of it is ſo common a practice among farmers, as it is in this. Almoſt every principal farmer, upon the margin, burns his own lime.

There are, beſides, great number of "ſale kilns" for ſmaller farmers, and for the centre

of

of the Vale, where no materials for burning are to be had. There is an inſtance of one man occupying eight or ten kilns; burning two or three thouſand chaldrons, yearly.

The LIME HUSBANDRY of this Diſtrict, therefore, merits particular notice. The ſubject requires the following diviſion:

1. The materials burnt.
2. The method of burning.
3. The coſt, and the ſelling price.
4. The ſoils, and the crops to which it is applied.
5. The method of applying.

1. MATERIALS. On the NORTHERN MARGIN of the Vale, lime is burnt ſolely from *ſtones*, of different colours and contextures. The ſpecies moſt prevalent are—a ſtrong grey LIMESTONE GRANITE; and a ſpecies of blue and white MARBLE, the blocks, whether large or ſmall, being blue at the core, and lighter-coloured toward the outer ſurface.

One hundred grains of the former, taken from a lower ſtratum of PICKERING-CASTLE-BANK, yield fortythree grains of air, and ninetyfour grains of calcareous earth, leaving a reſiduum of ſix grains; chiefly a brown ſilt, with a few gypſum-like fragments.

One

One hundred grains of the latter, taken from the lower ſtratum of a quarry, near KIRBYMOORSIDE, afford thirtynine grains of air, eightyſix and a half grains of diſſoluble matter; and thirteen and a half grains of reſiduum, fine impalpable ſilt.

The lime, produced from the former, is of a duſky colour, and falls in rough coarſe GRAINS *; that, of the latter, burſts into a white volatile flour-like POWDER.

The ſtones of different quarries are different in quality, but none of them differ widely from the ſpecimens above deſcribed.

On the SOUTHERN HEIGHTS, the prevailing material is a ſingular ſpecies of SOFT CALCAREOUS GRANITE. Its colour a dirty white: its contexture reſembling the grains of white muſtard-ſeed, or the roe of fiſh, run together with a cement of chalk or marl †. The hardneſs of this *ſtone* (if it merit the name) increaſes with the depth of the quarry. The lower blocks are uſed in building; but the upper ſtratum, for three or four feet below the ſoil, is generally a STONE MARL of

* Each grain being compoſed of a ſeries of eggſhaped ſhells, incloſed within each other.

† Reſembling, in contexture, the lime of the Pickering ſtone.

of no mean quality, but varies in different quarries. I have not learnt, however, that in any inſtance it has been applied as a MANURE. On the contrary, it appears to be univerſally caſt, as an incumbrance, to the bottom of the quarry *.

One hundred grains of the MALTON STONE, taken from the middle of the quarry oppoſite the Lodge at New Malton, yield fortyfour grains of air, and ninetyſeven grains of calcareous earth, leaving three grains of reſiduum, chiefly a brown ſilt.

But the ſtones of different quarries vary in quality. One hundred grains, taken from a newly opened quarry, by the ſide of the road

* On this ſide of the Vale, too, the limeſtone rubble which lies between the ſoil and the rock, is much of it of the nature of MARL, and might in many caſes be applied, as ſuch, with advantage. Its effect, where it has been thrown back from the edges of the quarries on Scallow-moor (a light loam inclining to a black moory ſoil) above Pickering, is ſtriking. The earth of this rubble is ſtrongly calcareous, and its ſtones are frequently covered with a white efflorescence, which is purely calcareous. Great quantities of it might be collected; and where a fit ſoil can be found (by trying experiments with it on a ſmall ſcale) in the neighbourhood of a quarry, it would, in all probability, pay amply for ſetting on. For the bottoming of farmyards and dunghills, the entire "coping," the ſoil inclusive, would be found excellent.

road leading from Malton to Caſtle Howard, yield only ninetyfour grains of diſſoluble matter.

I mention this circumſtance, as the plot of ground, in which this quarry is dug, was bought, it ſeems, at an extravagant price, for the purpoſe of burning lime; but the lime, *it is ſaid*, proving of an inferior quality, a principal part of the money will be ſunk. This ſhews the great uſe of analyſis, in aſcertaining, without hazard, a knowledge of the qualities of limeſtones*.

One hundred grains of WOLD CHALK, taken from a lime quarry near DRIFFIELD, yield fortyfour grains of air; three and a half grains of a ſoft mucilaginous reſiduum; and ninetyſix and a half grains of calcareous matter†.

2. BURNING.

* In this caſe, however, if the ſpecimen, I happened to take, was a fair one, the bad quality of the lime cannot be altogether owing to the ſtone; which, by this analyſis, is far from being a bad one, though inferior to that of the preceding experiment.

† In theſe experiments the quantity of CALCAREOUS MATTER is *inferred* from the quantity of RESIDUUM, no more of it being precipitated, than a ſufficiency to ſhew its *colour*; which, in every caſe, was of *ſnowy whiteneſs*; a principal evidence of its being a *pure* calcareous earth. The quantity of AIR and the quantity of RESIDUUM were, in each experiment, cloſely attended to.

2. BURNING. In giving the detail of this operation, the following ſubdiviſions will be requiſite:

1. Building the kiln.
2. Raiſing and breaking the ſtones.
3. Coals and their proportion.
4. Filling the kiln.
5. Drawing the kiln.

1. *The kiln.* The materials are either limeſtone, entirely, or limeſtone, lined with bricks on the inſide. Neither timber, nor mortar, is here uſed, in building a lime kiln; the former preſently decays, and the latter, by alternately ſwelling and ſhrinking, burſts the walls; beſides rendering them, in the firſt inſtance, too tight to admit a proper quantity of air: no other air holes, than the "eyes" at which they are kindled, being made in the kilns of this diſtrict *.

The *form* of the cavity is an irregular cone inverted. At the bottom, are generally two eyes, oppoſite to each other; the cavity being here contracted to a thin point, or narrow trough; the width that of the eyes. As the walls are carried up, the cavity takes, by degrees,

* 1796. In ſome Diſtricts, where tight walls are in uſe, ſmall air holes are left to give the requiſite ſupply. See MID. ECON. Min. 2.

grees, a circular, or ſometimes an *oval* line; at the ſame time receiving, as it riſes, *a conical* form; until, having reached ſomewhat more than half its intended height, the form is changed to *cylindrical*; or is ſometimes *contracted* towards the top. The proportion, between the depths and the diameters of theſe kilns, is that of the depth; being, generally, about one and a half diameter of the top.

The *ſize* varies from ſix to forty chaldrons.

2. *The ſtones.* The art of *raiſing* ſtones can only be learned by experience, in the given quarry in which they are to be raiſed. They are ſometimes raiſed by the day; ſometimes by the load; but, moſt generally, the entire labor of burning is taken, together, at ſo much a chaldron of lime.

The *breaking*, of hard ſtrong ſtones, is a laborious part of the operation of limeburning. On the north ſide of the Vale, it is done, by men, with large ſledge hammers; but, on the Malton ſide, where the ſtone is ſoft, women are frequently employed in breaking.

The medium *ſize* is that of the two hands; but men, burning by the chaldron, will not, unleſs well attended to, break them ſo ſmall: ſtones, nearly as big as the head, are ſometimes,

times, but very improperly, thrown into the kiln; for unleſs the proportion of coals be unneceſſarily large, the ſurface, only, is burnt to lime, the core remaining a lump of unburnt ſtone.

3. *Coals.* The Morelands, for the laſt fifty years, have furniſhed the north ſide of the Vale with coals, for burning lime, and for an inferior ſpecies of fuel. The ſeam of this coal is thin, and the quality, in general, very ordinary.

Before the diſcovery of theſe coals, lime was burnt with furze, and other bruſhwood; but notwithſtanding the Morelands are, now, nearly exhauſted of coals (unleſs ſome freſh diſcovery ſhould be made), the Diſtrict is relieved from the apprehenſion of returning, again, to its ancient mode of burning lime. The Derwent, beſide an ample ſupply of coals for fuel, brings an inferior kind (both of them raiſed in Weſt Yorkſhire) for the purpoſe of limeburning. The eaſtern end of the Vale is equally fortunate, in this reſpect, by having the port of Scarborough in its neighbourhood. And ſee INL. NAV. p. 15.

The *proportion* of coals and ſtones varies with the quality of the coals, and likewiſe, but in a leſs degree, with the quality of the ſtone:

ſtone: the method of burning, too, varies the proportion. *Three chaldrons of lime from one of coals* (the meaſures equal) may be conſidered as the mean produce. From two and a half to three and a half for one, includes the whole extent of produce of well burnt lime.

4. *Filling.* Some kindling being uſed at the eyes, and an extraordinary proportion of coals at the bottom of the kiln, it is filled up with ſtones and coals, in thin alternate layers; thoſe of ſtones being five or ſix inches thick; with coals in proportion; the coals, if not ſufficiently ſmall, being previouſly reduced to a gravel-like ſtate; in order to run down, more freely, between the interſtices of the ſtones, and thereby to mix, more evenly, with them.

The materials are caſt into the kiln, with large ſcuttles, or ſhallow baſkets; which are filled with ſtones, by means of an iron-toothed rake, compoſed of four teeth, about ſix inches long, of a head about a foot long, and of a handle about four feet long.

If ſeveral men be employed, in filling a kiln, it is common for each man to fill and empty his own ſcuttle. But this is an uncertain, and therefore an improper, way of proceeding.

ceeding. Much depends on the regularity and evenneſs of the layer, and the due proportion of coals; and to judge of this, with ſufficient accuracy, requires ſome experience, and a ſteady eye; eſpecially when the kiln is on fire, and the cavity to be filled up is obſcured by ſmoke. If more than one perſon be employed, in this caſe, it is highly probable the work will be imperfectly done.

Among the ſale kilns, about Malton, there is an excellent regulation, in this reſpect. The ſcuttles are all filled, and brought to the top of the kiln, by WOMEN and BOYS, who deliver them to the MASTER, or his foreman, ſtanding there to receive them, *with his eye fixt within the kiln*; by which means he is enabled to diſtribute the ſtones and coals, with the greateſt accuracy.

5. *Drawing*. There are two ſpecies of kilns; or rather one ſpecies uſed in two different ways.

A kiln which is filled, fired, and ſuffered to burn out, before any of its contents be drawn, is called a "STANDING KILN."

If the contents be drawn out, at the bottom, while the upper part is yet on fire,—the vacancy at the top being repeatedly filled up with ſtone and coal, as the lime is ex-

tracted at the bottom,—the kiln is termed a "DRAW KILN."

Since coals have been uſed in the burning of lime, draw kilns have, until of late years, been moſt prevalent. But, at preſent, ſtanding kilns are moſt in uſe.

The reaſons given, for this change of practice, are theſe: firſt, that the lime is burnt, *evener*, in ſtanding than in draw kilns; in the drawing of which, the ſtones are liable to hang, round the ſides of the kiln; thoſe in the middle running down, in the form of a tunnel; thereby mixing the raw with the half-burnt ſtones. The conſequence is, the outſide ſtones are burnt too much, the inſide ones too little; the ſtones, too frequently, running down to the eye, in a half-burnt ſtate. Secondly, the unevenneſs of ſurface, left by this method, together with the obſcurity cauſed by the ſmoke, render the *filling difficult*; under-burnt ſtones, or an unneceſſary waſte of coals, is the inevitable conſequence. A third argument in favor of ſtanding kilns is, that a *greater proportion* of well burnt lime may be produced, from the ſame quantity of coals. It is allowed that more kindling fuel is requiſite; and, at the bottom, a greater proportion of coals; but the

the fire, by this means, getting a ſtrong head, a leſs proportion of coals is required, in the body of the kiln; and what, perhaps, is of ſtill more conſequence, leſs heat is loſt at the top of this, than of the draw kiln; which is always uncovered, and too frequently hollow and full of cracks; while the top of the ſtanding kiln, being piled up in a conical form, and cloſely covered with ſods or rubbiſh, collects a greater body of fire, and keeps in the heat more effectually.

One circumſtance, however, relative to the ſtanding kiln, requires to be mentioned. The inſide ſhould be *lined with brick*. For every time a kiln, which is lined with limeſtone, is ſuffered to go out, a ſhell of lime peels off the inſide; by which means the walls are ſoon impaired.

The lime is *drawn* out at the "eyes," with a ſhovel, and generally carried out in ſcuttles, or in baſket meaſures, to the cart or waggon.

Of a living kiln, the drawing is generally continued, until red aſhes begin to make their appearance. But ſtanding kilns are ſuffered to burn undiſturbed, until the fire go out; except, perhaps, when the fire is riſing toward the top, and a freſh ſupply of air is

wanted, a few ſhovelfulls are drawn at either eye, by which means a degree of hollowneſs is formed, and freſh vigour given to the fire.

From theſe circumſtances, it is plain, that a regular ſupply of lime cannot be had, from leſs than three ſtanding kilns: one filling; one burning; one drawing. The ſmaller burners, however, have frequently only two; and, for a farmer, one, proportioned to his farm, is ſufficient *.

3. COST and PRICE. The ordinary wages for the whole labor of raiſing, breaking, filling, and drawing, is 18d. to 20d. a chaldron.

At MALTON, the *labor*, if taken by the groſs, is about 18d. The price of "lime-kiln

* About Brotherton and Nottingley, near FERRYBRIDGE, from whence immenſe quantities of lime are ſent, to diſtant parts of the Vale of York; particularly toward Eaſingwood; the kilns are very *ſhallow* and *wide*; the cone of materials piled above the ſurface, being, to appearance, equal to the contents of the kiln. This renders the emptying of the kiln very eaſy; the lime being all thrown from the ſurface, or through a kind of door-way in the ſide; not drawn out of the eyes; which are in this caſe, of no other uſe than to kindle at, and to admit a ſupply of air. Thoſe kilns are much leſs expenſive than the kilns of *this* Diſtrict; and more convenient. But query, Do they give as much heat, with the ſame quantity of coals, as a taller more cylindrical kiln?

kiln" *coals*, with carriage from the keels to the kiln, about 14s. a chaldron (of thirtytwo buſhels) the *produce*, better than *three for one*. The whole *coſt* about 6s. the *ſelling price* 7s. a chaldron.

At PICKERING, the *labor* is 20d. a chaldron: the price of "moor coals" and carriage 16s. of "Malton coals" and carriage, 18s. The *produce*, if ſufficiently burnt, *three for one*. The mean *coſt* is therefore about 7s. 6d. the *ſelling price* 8s. a chaldron. The building and repair of kilns; the wear of tools; the value of the ſtone in the quarry; and, in ſome caſes, the carriage of it from thence to the kiln, are drawbacks upon the profits, which appear in the above calculations. If therefore the ſtones be *ſufficiently burnt*, the neat profit is, in this caſe, very ſmall *.

* Nothing, perhaps, would encreaſe the profits of lime-burning, in *this* place, more, than the kiln being filled by the hand of the maſter, or ſome judicious perſon, not intereſted in a waſte of coals. It is the intereſt of men, who burn by the chaldron, to underbreak the ſtones, and to make up the deficiency of labor with an increaſe of coals; which, likewiſe, will make up for neglect, or want of judgment, in filling. Let the ſtones be raiſed and broken by the chaldron, or the kiln; but let the filling be done by women

4. APPLICATION. It has already been obſerved, that lime is applied, indiſcriminately, to every ſpecies of SOIL.

On the higher drier lands, its utility is evident.

At Malton, it is laid on a *calcareous ſoil*, with ſucceſs.

In a comparative experiment, fairly and accurately made, on a *redſtone ſoil* above Pickering, with three chaldron of lime an acre; the value of the lime, to the firſt crop, wheat, was not leſs than two quarters, an acre, and the ſucceeding crop of oats, (which now are upon the ground, Aug. 1787.) is a ſtill ſtronger evidence of the great utility of lime, *in ſome caſes*: in this caſe, the crop is at leaſt *threefold*.

Nevertheleſs, it may be prudent in the occupiers of the *cold moiſt clays*, in the bottom of the Vale, to lime with caution.

Its uſe to the *looſe ſandy ſoils* of the Weſt Marſhes is, I believe, fully eſtabliſhed; yet, in a comparative experiment on a *black moory ſoil, on clay*, its effect has thus far (the third crop) been *detrimental*, rather than uſeful.

It

women and boys; by which means induſtry will be encouraged, and the ſtones, by paſſing under the maſter's eye, will of courſe be rejected, if not ſufficiently broken.

It is not my intention to damp the ſpirit of improvement, but to endeavour to direct it to ſuitable objects. Nothing, at preſent, but COMPARATIVE EXPERIMENTS can determine the value of a given lime, to a given ſoil; and no man can, with common prudence, lime any land, upon a large ſcale, until a moral certainty of improvement has been eſtabliſhed, by experience.

The prevailing CROP is *wheat on fallow*. It is alſo pretty generally ſet on, for *rape*, *turneps*, or other crop, after *ſodburning*, and ſpread among the aſhes. It is alſo, not unfrequently, ſet on for *barley*. But its effect, to the *firſt crop*, except of wheat or rape, is, I believe, ſeldom perceptible.

But beneficial as lime undoubtedly is, in ſome caſes, to CORN, its benefit to GRASS is a matter in diſpute, even among the farmers of Yorkſhire. Incidents are authenticated in which, to general appearance, it has been *detrimental*.

But without the aſſiſtance of *compariſon*, the judgment is at a loſs to aſcertain, with any degree of preciſion, the effects of Manures. Nevertheleſs, general appearances, to thoſe who have a knowledge of the nature of the ſoil, have their weight.

It ſeems, however, to be a generally received idea, that lime, which is laid on for graſs, is not thrown away; for, whenever the land is again turned up, its benefit to corn will have full effect. See NAT. HERB.

5. LIMING. Long as lime has been in common uſe, as a manure, the proper method, of applying it to the ſoil, is far from being univerſally practiſed.

The *methods* of liming are various.

The worſt is that of laying it in large heaps, and ſuffering it to run to jelly, before it be ſpread upon the land.

Next to this is ſetting it about the land, in *ſmall hillocks*; for although theſe hillocks be ſpread, before they approach the ſtate of mortar, this method is injudicious.

Lime, which falls in the open air, does not fall to powder, but breaks into checquers, or ſmall cubical maſſes; which, being once buried in the ſoil, may remain in it, for ages, without being mixt intimately with it.

As far as experience and theory have yet reached, lime ought to be ſpread in a ſtate of PERFECT POWDER, and be mingled, intimately with the ſoil; and thus, by aſſimilating the two ingredients, form with them one homogeneous, calcareous maſs.

A *ſingle*

A *ſingle ſtone*, expoſed to a moiſt atmoſphere, falls into *fragments*, not into *powder* *. The ſmaller the heaps, the nearer they approach to ſingle ſtones; there is a greater proportion of *ſurface*, and conſequently a greater proportion of *fragments*.

It is therefore the practice, of judicious huſbandmen, to ſet lime upon the land, in LOAD HEAPS, and ſpread it over the ſoil out of carts, *as ſoon as it is ſufficiently fallen*.

There is an inſtance of practice, in this neighbourhood, and, I believe, only one, which is ſtill ſuperior to that laſt mentioned. In this inſtance, the load heaps are *turned over*, not ſo much to finiſh the falling, as to gain an opportunity of burying the granulous ſurface of the heaps; by which means the fragments are at leaſt leſſened, if not reduced to powder.

In the MORELANDS, a ſtill better practice is ſaid to prevail. There, the heaps are *interlayered*, and *covered up*, with *moiſt* "*turf-mold*"

* It is obſervable, however, that much depends upon the nature of the ſtone, from which the lime has been burnt. Stones of a uniform texture, as moſt marbles, are leſs liable to fall in granules, than ſtones which are naturally compoſed of grains, or are divided by fiſſures into natural fragments.

mold" (the rubbiſh from peat and turf fuel), which bringing on a rapid fall, the whole is ſet on fire, and the ſurface kept free from granules, by a covering of dry aſhes.

This leads to a general IMPROVEMENT in the method of SLAKING LIME: Cover up the heaps, whether large or ſmall, with SOIL, either of the field they are ſet in, or that of lanes or ditches, carted to them for the purpoſe; and, if a ſpeedy fall be required, throw water over this covering. See Art. CEMENT, page 112.

6. TIME, &c. OF SPREADING. If lime be uſed on *fallow for wheat*, it is generally ſpread on, in *July*; good farmers making a point of *harrowing it in, as faſt as it is ſpread*, and plowing it under, with a ſhallow furrow, as ſoon as convenient.

7. The uſual QUANTITY ſet on is three to four chaldrons an acre.

IV. DUNG. Nothing ſufficiently noticeable, reſpecting this ſpecies of manure, has occurred to me; excepting ſome incidents relating to the manuring of graſs land, which will appear under the head NATURAL HERBAGE; and excepting a general deficiency in Farm-yard Economy, for which ſee FARM-YARD MANAGEMENT.

SEMINATION.

IO.

SEMINATION.

THE SPIRIT OF IMPROVEMENT may have led ſome *gentlemen*, but, I believe, not one *yeoman*, or regular-bred *farmer*, to make experiments in the DRILL HUSBANDRY; at leaſt, not of late years. In the day of Mr. Tull, ſome trials were made of it; but the reſults were not ſufficiently favorable to eſtabliſh it as a practice.

A ſingularity in the method of ſowing BROADCAST is noticeable; though not peculiarly excellent. The common way is to *go twice over the ground*, ſowing half the ſeed one way, and (returning on the ſame land) half the other; the ſeedſman, in this caſe, filling his hand at one ſtep, and making his caſt at the next. But, in the method under notice, he caſts *at every ſtep*, and ſows the whole of the ſeed, *at once going over*. This method is more expeditious, than the common way; but it requires a ſteady eye, and an expert hand, to ſeed the ground evenly.

WEEDS.

II.

WEEDS and VERMIN.

I. SPECIES OF WEEDS. There are, in this Diſtrict, men who have been ſingularly obſervant, with reſpect to the nature of WEEDS; marking their CONTINUANCE, and deſcribing their methods of propagation and *rooting*, with *more* than botanical accuracy.

What I principally propoſe, under the preſent head, is, to enumerate the SPECIES OF WEEDS moſt noxious to the ARABLE LAND of this neighbourhood, and to note what appears to be worthy of notice, reſpecting the different ſpecies.

It may be proper to ſay, that in arranging the ſpecies I have *endeavoured* to place them according to their DEGREES OF NOXIOUSNESS; whether it ariſe from their reſpective qualities, or from the quantity which prevails, *in the neighbourhood of Pickering*. The GRASSES and the *ſhrubs* are purpoſely kept ſeparate, to

ſhew,

ſhew, with greater perſpicuity, their ſeveral degrees of hurtfulneſs, to the arable lands of the Diſtrict under obſervation.

Provincial names.	*Linnean names.*	*Engliſh names.*
Common thiſtle.	—*ſerratula* * *arvenſis*,	—corn thiſtle.
Docken,	—*rumex criſpus*,	—curled dock.
Nettle,	—*urtica dioica*,	—common nettle.
Swine thiſtle,	—*ſonchus oleraceus*,	—common ſow thiſtle.
Wild oat,	—*avena fatua*,	—wild oat.
Runſh,	—*ſinapis arvenſis*,	—wild muſtard.
Runſh,	—*raphanus raphaniſtrum*,	—wild radiſh.
Runſh,	—*braſſica napus*,	—wild rape.
Dea-nettle,	—*galeopſis tetrahit*,	—wild hemp.
Hairough,	—*galium aparine*,	—cleavers.
Groundſil,	—*ſenecio vulgaris*,	—groundſel.

Chicken-

* Let no voluminous writer lay claim to perfect accuracy. Linneus, whoſe ſyſtem is a wonderful exertion of the human mind, with reſpect to accuracy of arrangement, appears to have made an evident miſtake, in the claſſification of this common plant. How he could be induced to tear it from its *natural* family CARDUUS, and force it into that of *ſerratula*, may now be difficult to be aſcertained. I retain the name,—but proteſt againſt the propriety of it. The LINNEAN NAMES are now gone forth, throughout all nations; and whoever changes them is ſpeaking a language unknown to UNIVERSAL BOTANY.

Provincial.	*Linnean.*	*English.*
Chicken-weed,	—*alsine media*,	--chickweed.
Dog-finkle,	—-*anthemis cotula*,	—-maithe weed.
Dog-finkle,	--*matricaria chamomilla?*	--corn camomile.
Cup-rose,	—*papaver rhœas*,	--round smooth-headed poppy.
Cup-rose,	--*papaver dubium*,	--long smooth-headed poppy.
Bur thistle,	—*carduus lanceolatus*,	—spear-thistle.
Red thistle,	—*carduus palustris*,	—marsh-thistle.
Swine thistle,	—*sonchus arvensis*,	—corn sow-thistle.
Crowfoot,	---*ranunculus repens*,	--creeping crowfoot.
Foal foot,	—*tussilago farfara*,	—coltsfoot.
	potentilla anserina,	—silverweed.
Fat hen,	—*chenopodium album*,	—common-goosefoot.
Fat hen,	—*chenopodium viride*,	—redjointed goosefoot,
Popple,	—*agrostemma githago*,	—cockle.
Stoney-hard,	—*lithospermum arvense*,	—corn gromwell.
Corn bind,	--*polygonum convolvulus*,	--climbing buckweed.

Sour-

Provincial.	*Linnean.*	*Engliſh.*
Sour-docken,	*rumex acetoſa,*	common ſorrel.
Sour-docken,	*rumex acetoſella,*	ſheep's ſorrel.
Great horſeknobs,	*centaurea ſcabioſa,*	corn knobweed.
Great blue-caps,	*ſcabioſa arvenſis,*	corn ſcabious.
Cuiſhia,	*heracleum ſphondylium,*	cow-parſnep.
	chryſanthemum ſegetum,	corn marigold.
Yer-nuts,	*bunium bulbocaſtanum,*	earth nuts, or pig nuts.
	daucus carota,	wild carrot.
	centaurea cyanus,	bluebonnet.
	trifolium melilotus-officinalis,	melilot.
	trifolium alpeſtre,	alpine trefoil.
Docken,	*rumex obtuſifolius,*	broadleaved dock.
Docken,	*rumex ſanguineus,*	bloody dock.
	carduus nutans,	nodding thiſtle.
	carduus eriophorus,	woollyheaded thiſtle.
	thlaſpi campeſtre,	common mithridate.
	lapſana communis,	nipplewort.
	polyganum perſicaria,	common perſicaria.

poly-

Provincial. *Linnean.* *Engliſh.*

polyganum aviculare,—hogweed.

mentha arvenſis,—corn mint.

chryſanthemum leucanthemum, — oxeye daiſey.

ranunculus arvenſis,—corn crowfoot.

ranunculus acris,—common crowfoot.

cucubalus behen,—bladder campion.

Cornbind, —*convolvulus arvenſis*, —corn convolvulus.

achillea millefolium,—milfoil.

Saxifrage, —*peucedanum ſilaus*, —meadow ſaſſafras.

lycopſis arvenſis,—corn buglos.

Bur-docken,—*arctium lappa*,—burdock.

antirrhinum linaria, —common ſnap-dragon.

valeriana locuſta,—corn valerian.

reſeda luteola,—weld.

Breckens,—*pteris aquilina*,—fern.

Crake-needle, —*ſcandix pecten-Veneris*, —ſhepherd's needle.

veronica hederifolia,—ivyleaved ſpeedwell.

ceraſtium vulgatum,—common mouſe-ear.

fumaria officinalis,—common fumitory.

euphorbia helioſcopia,—ſun ſpurge.

ana-

Provincial.	*Linnean.*	*Engliſh.*
	anagallis arvenſis,	pimpernel.
	filago germanica,	common cudweed.
	euphraſia odontites,	red eyebright.
	hypochæris radicata,	longrooted hawkweed.
	myoſotis ſcorpioides,	ſcorpion mouſe-ear.
	viola tricolor,	common panſie.
	prunella vulgaris,	ſelfheal.
Quicks,	*triticum repens*,	couchgraſs.
	feſtuca duriuſcula,	hard feſcue.
White graſs,	*holcus mollis*,	couchy ſoft graſs.
	avena elatior,	tall oatgraſs.
	agroſtis alba,	creeping bentgraſs.
	alopecurus agreſtis,	field foxtail.
Droke,	*lolium temulentum*,	darnel.
	dactylis glomerata,	orchardgraſs.
White graſs,	*holcus lanatus*,	meadow ſoftgraſs.
Aſh,	*fraxinus excelſior*,	aſh.
Aſpen,	*populus tremula*,	trembling poplar.
White thorn,	*cratægus oxyacantha*,	hawthorn.
Black thorn,	*prunus ſpinoſa*,	ſloethorn.

Provincial. *Linnean.* *Engliſh.*

Briar,—*rubus fruticoſus*,—common bramble.

rubus cæſius,—dwarf bramble.

Cat whin,—*roſa ſpinoſiſſima*,—burnet roſe.

Ruſtburn,—*ononis arvenſis ſpinoſa*,—thorny reſtharrow.

Ruſtburn,—*ononis repens*,—trailing reſtharrow.

II. THE MEANS OF EXTIRPATION. There are two ways of extirpating weeds from ARABLE LAND: by *fallowing*, and by *weeding*.

1. By the term FALLOWING, is meant repeated plowings, harrowings, &c. between the crops; whether theſe plowings, &c. be given in two, in twelve, or in eighteen months.

There are ſeveral ſpecies of weeds, which cannot be wholly overcome, without fallowing. Weeds, which propagate their ſpecies, by SUCKERS FROM THE ROOT, are invigorated, by a *ſingle plowing*; which, by giving a freſh ſupply of air and openneſs to the ſoil, gives freedom to the ſuckers; and, by deſtroying the ſeed weeds in the operation, the ſuckers are left in poſſeſſion of the ſoil: and whoever attempts to overcome root weeds with

with the *hoe*, may be ſaid to be unacquainted with the practice of huſbandry.

The CONTINUANCE of a fallow, and the number of plowings requiſite, depend on the ſeaſon, and on the number and the nature of the weeds, to be deſtroyed. If the ſpring ſeaſon be found inſufficient to effectuate the purgation,—take the ſummer, and even the autumn, the winter, and the enſuing ſpring, *rather than crop an under-worked fallow*, which is but little ſuperior to a ſingle plowing. One ſtirring, towards the cloſe, is frequently more valuable, than two or three plowings at the outſet. To begin a fallow, without continuing it, *until its intention be fully accompliſhed*, is throwing away labor, unprofitably.

2. By WEEDING, is meant the act of deſtroying or checking weeds, while the crop is growing, to prevent their preying upon the ſoil, and propagating their ſpecies by ſeeding; whether the operation be performed with the *hoe*, the *ſpade*, the *hook*, or the *hand* alone.

Next to the plow and harrow, the HOE is the moſt deſtructive to *ſeed weeds*; but the hoe ought not, in any caſe, to be relied on: the HAND, alone, ought to give the *finiſh* to

weeding: and the *later* this is given, ſo that the crop be not materially injured by the operation, the more valuable will be its effect.

The *cloſe* of this operation is ſimilar to that of the fallow. One *additional* weeding is given at a ſmall expence; and without it, perhaps, thoſe which preceded were of little benefit. One weed left to ſpread its ſeeds, this year, may be the cauſe of a hundred, the next.

III. VERMIN. The different ſpecies of vermin, which have more particularly excited notice, in this Diſtrict, are,

1. Mice.
2. Rats.
3. Dogs.

1. MICE. The mouſe rivals the ſparrow, in miſchievouſneſs toward the farmer. In the field, the barn, and the dairy, mice are equally troubleſome and deſtructive. In the field, the quantity of deſtruction is not eaſily to be aſcertained; but it is probably much greater, than the unobſervant are aware of. At ſeed time, and at harveſt, they not only feed freely upon corn, but fill their granaries with it, as a reſource in leſs plentiful ſeaſons *.

Much

* See MID. ECON. MINUTE 26. for a remarkable inſtance of this.

Much care is beſtowed on the deſtruction of moles; and it might be worth while to endeavour to leſſen the number of field mice, which, I am of opinion, are in their nature more injurious to the farmer than moles are.

In the rick yard, the barn, the dwelling houſe, the garden, and the nurſery ground, their miſchievouſneſs is too obvious to be overlooked, and the utility of leſſening their number, in theſe places, is too well known to require an enumeration of facts to prove it.

The method of deſtroying mice is a ſubject, not unworthy of the attention of any man, who is intereſted in rural affairs. If ſome art, or ſome natural enemies, were not employed, in leſſening their number, the entire ſupply of human food would not be ſufficient to ſupport them. Even in their preſent ſtate, I have heard it intimated, by a man whoſe obſervations are frequently juſt, that it is a diſputable point, whether the mouſe or the tithe man is a greater enemy to the farmer *.

* This idea, however, is more applicable, in a graſs land country, where corn, being leſs in quantity, is more liable to be deſtroyed by mice, than it is, in an arable country, where

The barn and the ſtackyard are uſually put under the care of the cat: to ſet a mouſetrap, in a barn full of corn, has generally been conſidered as a thing ſo unlikely to be effective, that it has ſeldom perhaps been tried: I have never met with an inſtance of it; excepting one in this Diſtrict; in which its ſucceſs has been extraordinary. A barn, which for many years had been remarkably infeſted with mice (notwithſtanding a numerous guard of cats), has, by a proper uſe of traps, been kept in a manner free from them.

It having been obſerved, during long experience, that theſe miſchievous animals, uncontented with their deſtruction among the corn, — attacked leather, greaſe, or other animal food, which happened to be left in the barn,—traps were ſet in their runs, and hiding places, and baited with theſe ſubſtances. The ſucceſs was every thing to be deſired; for although a total extirpation has not taken place, an annual ſaving of ſome quarters of corn has been the conſequence.

Under

where the proportion of corn is greater;—where the barn is oftener emptied,—and where pillar ſtack-frames, and pillar granaries, are generally more in uſe.

Under an idea, that it was a CHANGE OF FOOD which, in the barn, conſtituted the *bait*, the ſame principle was applied, in the cheeſe chamber, and with the ſame ſucceſs. Here, traps, baited with corn, were taken with avidity.

In the garden, it was obſerved, that much depended on the ſeaſon of the year: therefore, here, natural hiding places were ſought for; and if convenient ones could not be found, artificial ones were made, in different parts of the garden; with logs, ſtones ſet up hollow, on-edge, boards, &c. In theſe hiding places, a variety of foods are laid, for ſeveral days, whenever mice become troubleſome; and whatever food is preferred, with that traps are baited.

By theſe means, the entire premiſes have been kept almoſt wholly free from mice.

While the number is great, various kinds of traps may be uſed, provided they be properly baited: for taking a remaining artful few, the common ſteel trap, adapted to the ſize of the mouſe, has been found to be the moſt effectual.

2. RATS. This animal, equally artful and miſchievous, is difficult to be taken by ſtra-

tagem: in farm homesteads, situated near water, it is become almost impossible to keep down their numbers. In every country, they are a growing evil; not only in Rural Economy, but in manufacture, and in domestic life. Should their numbers continue to increase, with the same rapidity they have done since the present breed got footing in the island, they will, in no great length of time, become a serious calamity. They are, perhaps at present, an object of public attention.

3. Dogs. It is not through an antipathy to dogs, that I class them here among vermin. I am led to it, by facts, which, though not extraordinary, ought to be generally known.

A few years ago, the whole country was alarmed, with the apprehension of CANINE MADNESS. A considerable proportion of the dogs, kept in it, were actually mad. Much live stock, and several persons, were bitten. Fortunately, however, thus far, none of *these* have been attacked, by that horrid disorder; but they still live under the dreadful apprehension of their being, every day, liable to be seized,

ſeized, by the greateſt calamity human nature is liable to *.

In the courſe of laſt winter (1786-7) the value of SHEEP WORRIED BY DOGS, in this townſhip alone, was calculated at near one hundred pounds. A ſmall farmer, whoſe entire ſtock did not amount to more than forty, had thirteen ſheep, and eleven lambs, worried in one night.

Theſe

* Since writing the above, no leſs than ſeven perſons were, in this place, bitten by one dog! Much live ſtock has alſo lately been bitten. In a neighbouring village a calf, which had been bitten, was ſeized with madneſs, and bit the perſon who had the care of it.

What aggravates the firſt-mentioned inſtance is, that the perſon, to whom the dog belonged, knew that he had been bitten, a few weeks before, yet ſuffered him to go looſe, though urged to the contrary. Surely, on culprits like this, ſome ſevere penalty, or ſome ſevere puniſhment, ought to be inflictable. A general law againſt every man, whoſe dog is ſuffered to *ſtray*, in a ſtate of madneſs, might have a good effect.

If the practice of *worming* be really effectual, in preventing the miſchiefs of canine madneſs, a ſevere penalty is due from every owner of a dog, which has not undergone ſo ſalutary an operation.

Several inſtances are related of perſons, to whom canine madneſs has proved fatal, in this neighbourhood. And the inſtances of live ſtock, which have ſuffered by the ſame means, are innumerable.

Theſe are not mentioned as ſingular facts: every Diſtrict, and almoſt every year, afford inſtances of a ſimilar nature; nor do I mention them to excite a momentary indignation, in the breaſt of the reader; but in hopes that they may be inſtrumental, in rouſing the humanity, of thoſe, who have it in their power, to mitigate the danger, and leſſen the quantity of evil.

The quantity of human food, which is annually waſted on *uſeleſs* dogs, is itſelf an object of national attention. When the horrors of canine madneſs, the wanton torture of innocence, and the wanton deſtruction of one of the firſt neceſſaries of life are added, the object becomes of the firſt concern to the nation. Who, even in theſe days of Public Economy, would think ten thouſand pounds a year ill beſtowed, in doing away ſuch an accumulation of public evil? Yet who does not know that, in doing it away, ten times ten thouſand a year might be drawn into the national treaſury! Let not the patriotiſm of Princes, the ability of Miniſters, or the wiſdom of Parliament, be ſpoken of, in this country, until a NATIONAL ABSURDITY, ſo glaringly obvious, be removed.

There

There are men whom *friendſhip* inclines to the cauſe of the dog. Far be it from me to damp the flame of friendſhip. But is not the lamb equally, at leaſt, entitled to our friendſhip? Who ſees the little innocent dragged to the ſlaughter without regret; and who, without remorſe, could ſee one lying mangled in the field, half alive, half eaten up, by the mercileſs, yet *befriended* dog?

But the operation of a tax upon dogs would, probably, be different to what is generally conceived. I am of opinion, that, were ſuch a tax to be laid on judiciouſly, the immediate deſtruction of dogs would be inconſiderable. The tie of affection muſt be weak which a ſhilling, a year, would diſſolve: even the poor man's dog would die a natural death, under thoſe eaſy circumſtances.—But what poor man would think of paying, even a ſhilling a year, for a dirty troubleſome puppy, for which he had not yet conceived any particular affection? Thus the number of dogs would, annually, and imperceptibly, decreaſe.

In ſix or ſeven years, the tax would require an advance: its productiveneſs would be leſſened, and the rearing of another claſs of dogs

dogs would require *prevention*. In a few years more, it might receive its final advance.

The productiveneſs of the tax ought not to be conſidered, as the primary object of a tax upon dogs. The removal of the public evils, which have been enumerated, ſhould be at leaſt jointly conſidered. Five ſhillings a head would reduce the number of dogs; and would, perhaps, be found, on experience, to be more productive than a lower tax.

12.

HARVESTING.

NO DEPARTMENT of Rural Economy diſtinguiſhes the NORTHERN, from the MIDLAND, and SOUTHERN parts of the Iſland, ſo much, as the method of Harveſting. And, perhaps, no Northern Diſtrict is more ſtrongly marked, with this diſtinguiſhing characteriſtic, than that which is now under ſurvey.

1. Cutting corn with the ſickle.
2. Cutting corn with the ſithe.

I. THE

I. THE SICKLE. It is probable that nine tenths of the corn, which is cut with the ſickle, in *this* kingdom, is cut by *men*. In Surrey and Kent, a woman may ſometimes be ſeen with a ſickle in her hand. In Norfolk, it is a ſight which is ſeldom or ever ſeen. Here, it is almoſt equally rare to ſee a ſickle in the hand of a man; reaping—provincially, "ſhearing,"—being almoſt entirely done by WOMEN.

Three women and one man make a ſett; who, of a middling crop, do an acre, a day. If corn be thin, a man will bind after four women; if very thick upon the ground, he requires a boy to make bands for him.

Sometimes, the bands are laid for the women to throw their handfuls into; but, in general, they lay the corn in "reaps," of about half a ſheaf each; the binder gathering it up carefully, againſt his legs, in the manner wheat ſtraw is uſually gathered on the thraſhing floor. This is much the beſt way (though ſomewhat more troubleſome); the corn being, by this means, bound up tight and even, and the ſheaves made of an equal ſize.

The day wages of a woman, in harveſt, is 10d. of a man 2s. Thus wheat, which in

Surrey

Surrey would coſt 10s. to 12s. and which, in any country I have obſerved in, would coſt 7s. or 8s. is here cut for 4s. 6d. an acre.

But the ſaving of ſo much, an acre, is far from being the only advantage, ariſing from the practice of employing women in the work of harveſt. The number of hands is increaſed; the poor man's income is raiſed; the pariſh rates are in conſequence leſſened; and the community at large are benefited, by an increaſe of induſtry, and an acquiſition of health. How conducive to *this* are the employments of huſbandry, compared with thoſe of manufacture! And the work of Harveſt, ſo far from being thought a hardſhip, is, by women who have been bred to it, conſidered as a relaxation to domeſtic confinement, and leſs agreeable employments.

WHEAT and RYE are ſet up in ſhucks,—provincially "ſtooks,"—of twelve or ten ſheaves each; two of which are invariably uſed as "hood-ſheaves"; for hooding, capping, or covering the heads of the reſt. Twelve ſheaves are termed a "ſtook;" in which wheat, formerly, was generally ſet up; but unleſs the ſtraw be long, two ſheaves are not equal to the ſafe covering of ten. It is therefore, now, the more general practice, to

ſet

ſet them up in "tens;" by which means they are much more effectually covered.

In the ſouth of England, the covering of wheat is never practiſed; here, wheat is never left, a day, uncovered. Both practices are wrong. In fine weather, the ears of corn cannot be too much expoſed to the ſun and dews; if the grain be thin, even a ſlight ſhower is of great benefit to it. In a rainy ſeaſon, they cannot be covered too cloſely. Therefore, in the covering of wheat, as in other departments of huſbandry, the farmer ought to be directed by the ſeaſon; not by any bigot cuſtom of the country he happens to farm in.

II. SITHE. In the ſouthern and midland provinces, corn is invariably *mown outward*, and dried in *ſwath*. Here, it is as invariably *mown againſt the ſtanding corn*, and dried in *ſheaf*.

The method of ſheafing varies. Upon the Wolds, the prevailing method is to bind the ſheaves, in the uſual banding place, and to ſet them up, in "ſtooks." This is termed "binding;"—a practice which appears to be encreaſing in the Vale.

But formerly, the invariable practice was, and the prevailing practice ſtill is, here, to tie them

them near the top, and ſet them up in *ſingle ſheaves*, — provincially, "gaits." This is called "gaiting;" which, if the corn be weedy, or full of cultivated graſs at the bottom, is a moſt admirable practice.

1. In MOWING corn for ſheafing, a cradle of three points (ſimilar to that of two points uſed in Kent, and in mowing corn into ſwath) is generally placed over the ſithe, to collect the corn, and aſſiſt in ſetting it up ſtraight, but ſomewhat leaning, againſt the ſtanding corn. If corn ſtand fair, a man who knows how to ſet his cradle, and uſe his ſithe, will ſet it up with great evenneſs and regularity. If corn be ſomewhat diſordered, yet mowable, a bow (ſimilar to that uſed in moſt countries for mowing corn outward) is affixt to the ſithe, for the ſame purpoſe.

The mower is followed by a woman, who makes bands, and "lays out" the corn into ſheaf. This ſhe does, either with the hands alone, or with a ſhort-headed, long-toothed wooden rake: gathering the corn with the rake; and, when a ſheaf is collected, throwing it dextrouſly into the band, with her foot; without touching it with her hands; and, conſequently, without the inconveniency of ſtooping.

ſtooping. If the crop be large, the woman has generally a boy to make bands for her.

A man, or a ſtout boy, follows to tie and ſet up the ſheaves; or, if the crop be thin, one man binds after two ſithes.

2. SETTING UP SINGLETS. To do this properly, and expeditiouſly, there is an art and dexterity requiſite, which can only be learnt from practice. The band being looſely tied, at about the ſame diſtance from the head of the ſheaf, as it uſually is from the butts,—the binder lays hold of the ears, with both hands, immediately above the band, and ſtrikes the ſheaf down pretty hard upon its butts; in order to give it a flat even baſe. One hand (the right for inſtance) is then looſened, and inſerted edge-way into the middle of the butts. The body, with the arms in that poſture, is thrown forward, and brought round with a ſweep to the right; thereby ſpreading the butts of the right-hand ſide of the ſheaf. The ſituation of the hands is then changed: the right is placed upon the ears, the left within the ſheaf, bringing them round with a ſweep to the left, leaving the ſheaf a *hollow cone*.

If the face, in this operation, be turned toward the north, and, in the laſt ſweep, an

opening or breach be left toward the south, the rays of the sun will have admission, to keep the ground dry within, and assist the wind in drying the inner side of the sheaf.

These particulars may, on paper, appear tedious; but, in practice, an expert hand will go through them in a few seconds of time.

There is, however, a much readier way of setting up single sheaves; namely, by lifting them as high as the arms will conveniently reach; and bringing them smartly to the ground, with a jerking motion. This spreads the butts; but does not give the desirable *hollowness*; nor the *firmness*, which is requisite in windy weather.

When the singlets are dry enough, for carrying, they are "bound," in the usual banding place.

3. In BINDING SINGLETS, the band is laid upon the ground, about a foot from the skirts of the singlet; which is pulled over upon it, and bound in the common manner. The original band of the first sheaf is pulled off for the second; so that, without an accident, the first band, only, is required to be made, at the time of binding. This renders the operation less tedious than theory may suggest.

The

The ſheaves, when bound, are collected into heaps, and carried on the day of binding; or are ſet up in ſhucks, as accidents or conveniency may require *.

4. If the corn be "BOUND," AT THE TIME OF MOWING, it is ſet up in SHUCKS; in which it ſtands until it be fit for carrying.

This is leſs troubleſome, than firſt "gaiting" and afterwards "binding" it. And if the corn be ripe, and the bottom be tolerably free from weeds, it is, perhaps, the more eligible method, for corn which is cut with the SITHE.

But, for under-ripe, or weedy corn, though cut with the ſithe; and for all *oats* and *barley* which are cut with the SICKLE; "gaiting" is here conſidered, as eſſentially neceſſary. Corn

* GAITING. This practice is probably of Scottiſh extraction. In the dialect of the Engliſh language, now uſed in the Highlands of Scotland, where this practice is much in uſe, "GAIT" is the ordinary name, (or the eſtabliſhed pronunciation,) of the GOAT. In the dialect of the Celtic language, likewiſe in uſe there, ſingle ſheaves ſet up, as in this practice, are called GOURACS;—from *gour*, a *goat*,—*gourac*, a little goat;—the diminutive of *gour*.

Hence, there ſeems to be little doubt of the name having been taken from the animal. But whether the Saxon Scots borrowed the practice, and the name, from the Celts, or the Celtic Scots from the Saxons, may, now, be difficult to trace.

cut with the ſickle lies ſtraighter, and cloſer, in the band, than mown corn; which, being more or leſs ruffled, with the ſithe or the rake, does not bed ſo cloſely in the band; the air thereby gaining a more free admiſſion, into the center of the ſheaf.

If *barley* be ſhort upon the ground, free from weeds, and well headed (eſpecially the four-rowed barley or "big"), it is difficult to be "gaited;" the heads of the ſheaves being too bulky, and the butts not ſufficiently ſo, to form a baſis broad enough to ſupport them. Its ſlippery nature, alſo, renders it difficult to be kept in a looſely tied band. Barley, therefore, is more commonly bound after the ſithe, than oats are. But when it runs much to ſtraw, and is weedy, or full of graſſes at the bottom, gaiting becomes eſſentially neceſſary to accurate management. Barley is more liable, than any other grain, to take damage in the field; and every means of forwarding its drying, thereby ſhortening the length of time between the cutting and the carrying, ought to be employed.

Shucks of oats and barley, bound after the ſithe, are generally left uncovered, until the time of carrying. If, however, the ſeaſon be unſettled, and the heads be pretty well weathered,

weathered, while the butts are yet under dry, it is well to put on hood ſheaves, and thereby guard the grain from too great an expoſure to the weather.

General Observations on Harveſting Barley and Oats.

The COMPARATIVE ADVANTAGES of harveſting barley and oats, in ſheaf, are numerous. The waſte, throughout, is leſs; the corn, eſpecially in gaits, is, at once, got out of the way of the weather; the labor of carrying, houſeing, or ſtacking, is much leſſened; much barn room is ſaved; the labor of thraſhing is leſs; the ſtraw, if the harveſt prove wet, makes much better fodder; and, under this circumſtance, the corn preſerves its color, in ſheaf, incomparably better, than it does in ſwath.

The *apparent inconveniency* of Harveſting corn in ſheaf (I mean that which muſt ſtrike every one who has not duly conſidered the ſubject, and compared the nature and the quantity of labor, ſeparately, requiſite to each of the two methods of Harveſting) is the increaſe of labor, at the outſet. But if the laying out, and the binding, be done by

women and boys, or by men who cannot mow (which is almoſt invariably the caſe) the buſineſs of mowing goes on the ſame pace, or nearly the ſame pace, as it would have done, had the corn been mown into ſwaths. Beſides, the repeated turnings, which frequently are requiſite, and the cocking, which always is neceſſary, are entirely excluded, by binding.

Upon the whole, it is evident, that the quantity of *men's* labor is diminiſhed, not increaſed, by the practice of Harveſting in ſheaf. If, to this advantage be added, the eaſe and expedition, in the buſineſs of carrying (the moſt important buſineſs of harveſt, and that which requires the quickeſt diſpatch), we may fairly conclude, that, by Harveſting in ſheaf, the labor, the anxiety, and the hazard of harveſt are leſſened; while the quality, and conſequently the value, of the produce is increaſed.

My own practice having been in Diſtricts, where Harveſting, in ſwath, is the univerſal cuſtom, I had conceived, that the practice of Harveſting, in ſheaf, was only adapted to *a country thin of corn*; and that it was altogether impracticable, in what is called a CORN COUNTRY. But the WOLDS of this Diſtrict

leave

leave no room for ſuch a conjecture. The Yorkſhire Wolds are not only a corn country, but the farms are many of them of extraordinary ſize: nevertheleſs, it is the invariable practice of that Diſtrict to harveſt barley and oats, in ſheaf. One man, a few years ago, grew between three and four thouſand quarters of oats and barley,—every buſhel of which was harveſted in ſheaf.

I am too well aware of the difficulty of changing the cuſtom of a country, to recommend to any man, who farms in a ſouthern Diſtrict, to attempt to harveſt all his corn, in ſheaf, without regard to the weather, or the ſtate of the ſeaſon. But I will not heſitate to recommend, to every man, who has barley or oats to cut, in a wet ſeaſon, or in a late harveſt, to harveſt them in ſheaf.

In Surrey, and other counties, where mown corn is laid ſtraight in ſwath, there would be no difficulty in harveſting it, in ſheaf. The corn might be mown outward, in the uſual manner, and ſheaved out of ſwath; which is, perhaps, upon the whole, a better method of ſheafing, than that which has been deſcribed, as the practice of this Diſtrict.

The great art of laying corn ſtraight with the ſithe, whether it be mown inward or

outward, is to keep the face ſomewhat inclined toward the ſtanding corn: thus, in mowing outward, the left hand and the left foot ought to go ſomewhat foremoſt: on the contrary, in mowing inward, the right ſide ought to precede. Much depends upon ſetting the cradle, or the bow; which ſhould be ſo ſet, as to take the whole of the corn, cut at each ſtroke, without interfering with the ſtanding corn. The ſithe, in mowing, ought to be brought well round to the left, as if for the intention of throwing the corn behind the mower. To allow for this length of ſweep, the ſwath ſhould not be taken too wide; nor, in ravelled corn, ſhould the ſithe be too long.

By a little practice, *young* men, who can handle their ſithes, and whoſe diſpoſitions incline them to oblige, might, in any country, ſoon be rendered ſufficiently perfect, in the art of laying corn ſtraight, in ſwath; or of ſetting it up ſtraight, and evenly, againſt the ſtanding corn. In exerciſing theſe, young women might, at the ſame time, be taught to lay out the corn into ſheaves, and ſtout lads to ſet them up ſingly. A leiſure opportunity ſhould be embraced. The outſet ſhould be conſidered as a matter of amuſement. A

few

few acres, this year, might be an inducement to extend the practice to a greater number, the next. The art once acquired, it would be ready to be applied, on a large ſcale, whenever a wet ſeaſon, or a backward harveſt, ſhould happen.

13.

FARMYARD MANAGEMENT.

I. BARN MANAGEMENT. The ſubdiviſions of this ſubject, which are noticeable here, are,

1. Binding the ſtraw.
2. Winnowing the corn.

1. BINDING STRAW. Straw, of every kind, is bound upon the thraſhing floor. This, when ſtraw is not uſed at the time of thraſhing, would, in any country, be good economy. Straw in truſſes is much better to move, lies in leſs room, and retains its flavor longer, than looſe ſtraw does. In a country where cattle, in winter, are univerſally kept in the houſe, and foddered at ſtated mealtimes, the binding of ſtraw becomes

comes eſſential to good management. Each truſs—provincially, "fold"—contains an armful (that is, as much as the arms can conveniently *fold*); and this is the uſual meal for a pair of cattle. Thus the buſineſs of "foddering" is facilitated, and a waſte of ſtraw avoided.

2. WINNOWING. Under the article IMPLEMENTS, the preſent practice of winnowing, with the "machine-fan," was mentioned. All that remains to be done, here, is to endeavour to give ſome general rule, for the method of uſing it.

Practice, only, can teach the minutiæ of the art, which, though here ſo prevalent, is far from being well underſtood. The complexneſs of the machine is ſuch, that laborers, in general, are ignorant of the means of adjuſting it; and let its conſtruction be ever ſo perfect, much depends on regulating it, properly, for different kinds of grain; as well as in ſetting it, with truth, for any particular ſpecies.

The outlines of the art lie, in adapting the ſtrength of the wind, to a due and regular ſupply of the given contents of the hopper; and in adjuſting the ſeveral regulators, in ſuch manner, as to ſeparate the chaff, the capes, and

and the grain, with the greateſt poſſible exactneſs.

Wheat is generally run twice through the machine or mill; but, with a good machine, properly regulated, and deliberately fed, it may be made marketable, by running it once through. *Barley* and *oats* are ſeldom put through, more than once. And *beans* or *peas* may be cleaned, as faſt as a man can ſupply the hopper with them.

Superior advantages, of this ſpecies of fan, are diſpatch, the ſaving of the labor of one man, and the preſervation of the health of thoſe who are employed. The ſail fan,—the common winnowing fan of the kingdom at large,—requires one perſon to turn, one to riddle or "heave," and one to fill the riddle or ſcuttles; and, for this ſett, ſeven or eight quarters of wheat is a hard day's work. Two perſons, with a machine fan, properly ſet, and properly ſupplied, will winnow the ſame quantity, in half a day. The fan, itſelf, ſupplies the place of the perſon who riddles; and all the labor, which is neceſſarily beſtowed, on the difficult work of ſeparating the one continuous heap, into corn, chaff, and "capes," and running the intermingled parts down, again and again, to reduce them

to

to one or other of thoſe articles, is entirely ſaved.

II. YARD MANAGEMENT requires to be ſubdivided, in this caſe, into

1. Expenditure of ſtraw.
2. Raiſing yard manure.

1. EXPENDITURE OF STRAW. In the Vale, and the Morelands, cattle are, almoſt univerſally, kept tied up in houſe s or hovels, or under ſheds, which, if the aſpect be good and the ends properly ſheltered, are preferable to cloſe houſes. Warmth and dryneſs are doubtleſs of great advantage to cattle, in winter; eſpecially to lean ſtraw-fed cattle; which cannot bear the ſeverity of weather, ſo well as cattle whoſe keep is higher. But, in this, as in moſt things, there is a *medium* to be obſerved. The hair of cattle, kept in a cloſe warm houſe, naturally grows thin, and peels off, prematurely; expoſing the cattle, when turned out to graſs in the ſpring, to a degree of unneceſſary hardſhip, which, in its effect, is perhaps frequently worſe, than expoſing them in an open yard, in the winter months.

The warmth of the cattle, however, appears to be, here, only a ſecondary object: the SAVING OF FODDER ſeems to be the principal motive, for tying up cattle of every kind,

kind, in winter; by which means, almoſt every ſtraw is eaten; the cattle frequently lying without litter, upon the bare floors of their ſtalls. Twenty or thirty head of cattle are kept, here, on the ſame quantity of ſtraw, which, in moſt corn countries, is allowed to be picked over, by eight or ten.

The dung drops into a ſquare trench, which is cleaned every day, while the cattle are out at water, or in the fields at graſs.

Stalled cattle are uſually foddered, four times a day: in the morning; again in the forenoon; a third time when they are taken up from watering; and, finally, in the evening. The beſt of the ſtraw is given to the young ſtock, the inferior ſort to oxen. Cows are chiefly kept on hay, even when they are dry of milk: an evident impropriety; eſpecially when applied to the ſhort-horned breed of cows, which generally calve with difficulty.

On a general view, it is evident, that the expenditure of ſtraw, in this country, is adapted to its climature, and to its ſtate of huſbandry. Where graſs land abounds, cattle of courſe are numerous, and ſtraw proportionally ſcarce. On the contrary, in a corn-land country, ſtraw is more plentiful than

ſtock;

ſtock; and all that is thought of, there, is to get it *trodden* into manure.

2. RAISING YARD MANURE. It would be foreign, to the *preſent* work, to canvaſs the propriety of *treading* ſtraw into manure. This country has generally ſtock enough to *eat* every ſtraw it produces; therefore to *tread* it to manure, and to *waſte* it, are, here, ſynonymous expreſſions. It is all wanted as fodder, and it would be an evident abſurdity to litter the yard with it. All I propoſe, at preſent, on this ſubject, is, to recommend to my countrymen a more provident management of the little yard manure they make,—let its quality be what it may.

The general practice, at preſent, is to pile it on the higheſt part of the yard; or, which is ſtill leſs judicious, to let it lie ſcattered about, on the ſide of a ſlope; as it were for the purpoſe of diſſipating its virtues.

The urine, which does not mix with the dung, is almoſt invariably led off, the neareſt way, to the common ſhore; as if it were thought a nuiſance to the premiſes. That which mixes with the dung is, of courſe, carried to the "midden," and aſſiſts in the general diſſipation.

A yard

A yard of *dung*, nine tenths of which is ſtraw, will diſcharge even in dry weather, ſome of its more fluid particles; and, in rainy weather, is, notwithſtanding the ſtraw, liable to be waſhed away, if expoſed on a riſing ground.

But how much more liable to waſte is a mixture of dung and urine, with barely a ſufficiency of ſtraw to keep it together, in a body? In dry weather, the natural oozing is conſiderable; and, in a wet ſeaſon, every ſhower of rain waſhes it away, in quantity. It may be a moot point whether, in ſome caſes, half the eſſential virtues of the dung, as a manure, may not be loſt by improper management. Certain it is, that, in all caſes, much too great a proportion is loſt; and it behoves the huſbandmen of this Diſtrict, and of every Diſtrict where the houſing of cattle in winter is practiſed, to pay particular attention to the management of Farmyard manure.

If a ſmall proportion of the expence and attention, which has of late years been ſo well beſtowed on the making of DRINKING POOLS, were to be applied to the forming of DUNG YARDS, the profits, great as they are

in

in one caſe, would, I am perſuaded, be found ſtill greater in the other.

The Norfolk method of BOTTOMING the dung yard, with mold, is here indiſpenſably neceſſary, to common good management. There is no better manure, for GRASS LAND, than mold ſaturated with the oozings of a dunghill: it gets down quicker among the graſs, and has generally a more viſible effect, than the dung itſelf. To neglect ſo valuable a ſource of manure, is neglecting a mine of gold and ſilver, which may be worked at will. Under this management, the arable land would have the ſelf-ſame dung, it now has; while the graſs land would have an annual ſupply of riches, which now run waſte in the "ſtrands" and rivulets.

But, before a dung yard can, with propriety, be bottomed with mold, the bottom of the yard, itſelf, ought to be properly FORMED. A part of it, ſituated conveniently for carriages to come at, and low enough to receive the entire drainage of the ſtable, cattle ſtalls, and hog ſties, ſhould be hollowed out, in the manner of an artificial Drinking pool, with a rim ſomewhat riſing, and with covered drains laid into it, from the various ſources of liquid manure.

During

During the ſummer months, at leiſure times, and embracing opportunities of back-carriage, cover the bottom of the baſon, a foot or more thick, with mold,—ſuch as the ſcowerings of ditches, the ſhovelings of roads, the maiden earth of lanes and waſte corners, the coping of ſtone quarries, or the ſoil of fallow ground,—leaving the ſurface diſhing; and, within the diſh, ſet the dung pile: equally preventing the admiſſion of extraneous water into the reſervoir, and the eſcape of that which falls within its area.

14.

MARKETS and PAPER MONEY.

MARKETS. CATTLE and SHEEP are moſtly ſold in the MARKET TOWNS of the Vale. WHITBY and SCARBOROUGH take the ſurplus of ſuch as are fit for the butcher; and thoſe which are lean, are bought up by the SOUTH-COUNTRY DROVERS. MALTON is the principal market for *horſes, corn, butter,*

and *bacon*. *Oats*, ordinary butter, and bacon, find a market in the manufacturing Diſtrict of WEST YORKSHIRE: prime butter, and ſome bacon, travel, by way of Hull, to the METROPOLIS. Horſes are divided between the LONDON and FOREIGN MARKETS.

PAPER MONEY. An evil, which has been long growing in the markets of this kingdom, has here got to a height that entitles it to notice.

GOLD can no longer be conſidered as the medium of property. Let a man ſell his whole ſtock, at market, and it were mere chance, if he brought home with him more than a few guineas. The bulk of the value received is invariably PAPER:—not bank notes, —but paper of no other value, than that which is given it by the engraver, and the name, perhaps, of ſome ſhopkeeper, or other petty banker, wholly unknown to the farmer; who, probably, is entirely ignorant, as to whether the name, or names, be real or fictitious.

One *accident* has already happened, in this neighbourhood; and it is matter of aſtoniſhment, that more do not follow: a circumſtance, which can only be accounted for, by the

the *profits*, which this ſpecies of coinage affords *.

An arch cobler of Newcaſtle upon Tyne has made a fortune, by coining penny and twopenny notes †, which are highly embelliſhed, and rendered valuable, by a long liſt of reſpectable names; his friend *Criſpin* at the head of them. They are alſo payable in London, at a *houſe of names*, equally reſpectable and reſponſible: the fineſt burleſque upon modern banking, which can poſſibly be conceived. The fellow is ſaid to have pocketed, already, a thouſand pounds by the thought.

The *conveniency* of paper money few men will deny; eſpecially, now, when the weighing of gold is become, in ſome degree, neceſſary: a buſineſs which is extremely aukward, in a market. All the *farmer* wants is *ſecurity*.

On the other hand, the *profitableneſs* of paper money, to thoſe who coin it, is ſtill

* Not only by the intereſt of the amount of bills in circulation; but by *dead notes*; that is, bills loſt and deſtroyed by accident; the amount of which is clear gain.

† Circulated among the colliers, keelmen, and ſailors; every one being proud to have a "bank note" in his pocket.

less disputable. But why shall *individuals* be suffered to batten on the public, by the profits of COINAGE? Why shall one man be dragged to the gallows, for coining a few shillings, while others are suffered to amass fortunes, by coining five and ten pound pieces? *If paper money be political,* the NATION, not *individuals*, ought to have the profits arising from it.

But the insecurity of paper money, and the crime of coining it, form only part of the evil, which is here meant to be held up to view. I pretend not to the profound in political arithmetic; but I have always understood, that the prices of commodities, at market, bear a proportion to the quantity of money, in circulation. If this be in truth the case, the evil, here spoken of, has the most pernicious tendency.

In the *present state of Europe*, this country can preserve its *pre-eminence, as a nation*, by manufactures and commerce, alone. The demand for the manufactures of a given country will ever bear a proportion to their *comparative* price. The price of manufactures depends upon those of materials and labor; and *this* on the PRICE OF LIVING. If by a flow of cash in circulation (no matter whether

ther of gold, silver, copper, or paper) the prices of living, labor, and materials be suffered to advance, the demand for manufactures will of course decline, and with it the prosperity of the nation.

I wish not to intermeddle, officiously, in concerns of Government; but the subject, under notice, seems to be sufficiently connected with RURAL ECONOMICS, to warrant its being mentioned, in this place.

1796. These PRIVATE COINAGES, since they were here first held up to public notice, have engaged the attention of Government. To suppress or check them? No. To give them countenance, and literally to stamp their baleful effusions with public avowal.

END OF THE FIRST VOLUME.

RURAL ECONOMY

THE

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