

ESSAYS

ON.

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MISCELLANEOUS SUBJECTS.

BY

Sir JOHN SINCLAIR, Bart.

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ADVERTISEMENT.

I SHOULD hardly have ventured to have troubled the world with this publication, had I not flattered myself with the idea, that any person who will take the trouble of perusing the following Effays; will, on the whole, be inclined to say, " This is the Work of an Author who seems to have directed his attention to subjects connected with public utility and national improvement, and whose favourite object was, *not to have lived in vain.*"

LONDON, 10th May 1802.

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ESSAY I.

OBSERVATIONS

ON THE

NATURE AND ADVANTAGES

OF

STATISTICAL INQUIRIES;

WITH A SKETCH OF

**An INTRODUCTION to the proposed ANALYSIS of the
STATISTICAL ACCOUNT of SCOTLAND.**

ADVERTISEMENT.

THE Author of this Paper, was employed for several years, in carrying on an extensive correspondence with that most respectable body of men, the Clergy of the Church of Scotland, for the purpose of procuring from them *Statistical Reports** of their several parishes, which have been printed in 21 volumes octavo, and which probably contain the most valuable collection of interest-

* The word *statistic*, or *statistical*, may either imply inquiries connected with the general state of a country, or respecting matters of State. It is in the first sense that I use the term. The second is the meaning of the word in Germany; namely, denoting inquiries for the purpose merely of ascertaining the political strength of a country, and not the degree of happiness it actually enjoys, nor the means of its future improvement. In the former point of view, therefore, it becomes a *new* branch of politics, the superior utility of which, many of the most respectable characters in Germany, and in other parts of Europe, have acknowledged in the most flattering terms; and which a great warrior and statesman, the late President of the United States of America, (General Washington,) in a letter to the Author has thus characterised.—“ I cannot but express myself highly pleased with the undertaking in which you are engaged, (that of drawing up the Statistical Account of Scotland,) and give my best wishes for its success. I am fully persuaded, that when enlightened men will take the trouble to examine so minutely into the state of society, as your inquiries seem to go, it must result in greatly ameliorating the condition of the people, promoting the interest of civil society, and the happiness of mankind at large. These are objects truly worthy the attention of a great mind; and every friend to the human race must readily lend his aid towards their accomplishment.”

In regard to the second sense of the word *statistic*, the Germans, with their usual exertion and industry, have already brought statistical knowledge to a very high degree of perfection, and have rendered it a separate science of peculiar importance.

ADVERTISEMENT.

ing facts, relative to the internal state of a country, any where extant. It was his intention, as soon as the collection should be finished, to draw up an Analysis of the whole; but for some time past, his state of health and other occupations, prevented him from engaging in so laborious an attempt; and as, from various circumstances, it is impossible for him to foresee, whether it will ever be in his power, even to begin, far less to complete, such a work, he has thought it advisable, in the following sketch, to explain the nature of the plan which he intended to pursue; trusting, that if he should be unable to go through the task himself, some other person more fully competent, will undertake it, either on the plan that is here subjoined, or on any other that may be more likely to answer the objects which he had in view, "that of explaining the advantages which ought to be derived from political institutions, and the means of rendering those advantages more generally attainable than they usually are at present."

JOHN SINCLAIR.

London, 24th February, 1802.

ESSAY I.

OBSERVATIONS ON THE NATURE AND ADVANTAGES OF STATISTICAL INQUIRIES;

WITH A SKETCH OF

AN INTRODUCTION to the proposed ANALYSIS of the STATISTICAL ACCOUNT of SCOTLAND.

THE improvement of a country, and the situation of its inhabitants, in regard to the comforts and other advantages, which, as members of a political society they are justly entitled to expect, must in a great measure depend on the wisdom and the due execution of the laws by which the nation was originally governed, and the alterations, which, from time to time, are made therein*.

When such laws were at first composed, they were probably calculated for a small tract of country, and for the simple manners of an inconsiderable number of people. It did not require, therefore, any great depth of knowledge, nor much experience, nor extensive inquiry, to form them. But nations, for some time, are generally in a progressive state. They go on increasing their territory; adding to their population, and augmenting their wealth. Hence the same system of legislation,

* The state of the morals and manners of a country, must also have a most important influence on the happiness of any nation; but how can morals and manners be long preserved pure, without wise laws, properly executed? On the other hand, good morals, and manners adapted to them, must be of the greatest service in rendering any code of laws effectual.

which might answer for a small tribe, scattered over a barren country, and living in all the simplicity of early times, will not suit a great nation, inhabiting a fertile region, partaking of all the luxuries, and enjoying all the refinements, which the progress of civilization furnishes; and extending its commercial, and other relations, over the whole surface of the earth.

The more also that a nation increases in number, the more it gets into what may be called "*an artificial state of society.*" Its internal structure becomes more complicated; new ideas arise; new manners, and new wants occur; new professions are established; new difficulties are found, in providing additional sources of employment, and means of subsistence; and the result may be, unless guarded against by the wisest regulations, that one class of men may enjoy all the advantages of political society, to the greatest possible height of attainment, whilst the other classes, containing by far the largest portion of the community, may sink into an abyss of calamity and distress.

But why should this be the case? Why should not society always find itself in a progressive state of improvement, endeavouring to approach, as far as circumstances will admit of it, still nearer to perfection? Why should not a greater number of individuals, in every political community, enjoy a greater proportion of the pleasures and comforts of life than is usually the case at present? Of what advantage is the progress of civilization, the increase of knowledge, the accumulated wisdom and experience of ages, unless it furnishes the means of increasing the general happiness of mankind, and enables a greater number of individuals to enjoy the advantages of political society, or, what may be emphatically called, "*the blessings of human life?*"

This

This leads me to consider, 1. What those advantages or blessings are, to the enjoyment of which every individual member of a political society seems to be justly entitled; and, 2. What are the most likely means of rendering them as generally attainable as possible.

1. *Of the Sources of Human Happiness.*

The objects of human life may be comprehended under three general heads: 1. Animal, or individual pleasures; 2. Social gratifications; and, 3. Mental enjoyments: in other words, man may be considered as a mere animal; or as one formed for living in society with his fellow-creatures; or as a being, endowed with rational powers, and destined for eternity.

1. *Animal pleasures.*—As a mere animal, man requires, 1. Food; 2. Clothing; and, 3. Shelter: and nothing should prevent any industrious individual, in a well regulated community, from acquiring, by his labour and exertions, these indispensable requisites of comfortable existence.

1. *Food.*—The necessity of food, to repair the daily waste to which the human frame is subject, need not be dwelt upon. Without a regular and adequate supply of wholesome sustenance, the strongest frame becomes languid, and would soon perish. A regular and adequate supply of food, therefore, is the first and most essential of human wants. How that food operates in maintaining the human frame, and how such a number of articles, differing from each other in appearance, in taste, and in quality, can all contribute to the same end, that of nourishing and preserving in their full strength, for any considerable space of time, all the various parts of which the body consists, are mysteries, which it can

hardly be expected the defective state of human knowledge will ever be able to explain.

But food is not only to be considered as essential to human existence. The exertion necessary to procure it, is also to be accounted a source of healthful occupation and innocent amusement; nor is the satisfaction to be derived from consuming that food, to be reckoned altogether unworthy of attention, though too much time and anxiety ought not to be devoted to an object, which, at best, can only be viewed in the light of a mere animal gratification.

There is every reason to believe, that men at first lived principally on the spontaneous productions of the earth; or on the produce which the chase afforded. But when these became less abundant, many were driven to the necessity of eating insects, reptiles, and other loathsome animals, which could hardly be viewed without abhorrence: and, when exposed, as too often was the case, to the horrors of famine, men have been reduced to the dreadful extremity of devouring each other*. But these times are happily almost now over; and fortunately for man, the sources whence he may derive the means of subsistence, are various, and by exertion and industry, may be multiplied to an extent, far beyond the present demands of the species. It is certainly amongst the most important advantages of political society, that persons living in a civilized state, are more likely to obtain a regular and adequate supply of food, than the members of any barbarous community.

* See Goquet's *Origin of Laws*, vol. i. p. 77, and 79, and the various authors quoted by him, which fully prove the truth of what is above stated.

2. *Clothing*.—Next to food, clothing is the most essential requisite for human comfort. In some countries, it is true, the inhabitants are accustomed to go naked, and account the clothing worn by other men, as troublesome and unnecessary. But whatever may be the case, in some favoured spots, and under very peculiar circumstances, yet over the greater part of the globe, from coldness or variableness of climate, clothing is considered as essential, not only for the sake of decency, but as a source of protection and comfort, in consequence of the peculiar tenderness, delicacy, and texture of the human skin. Indeed, had men, like the brute creation, a natural covering, the species would not have been so well suited, to live in all the various climates of the universe, as they are at present. Whereas being enabled to procure clothing, by means of an infinite variety of articles, their dress may be varied, according to the situation of each individual, and the place where he resides.

3. *Shelter*.—The pleasures of shelter itself, may properly be classed under the head of animal gratifications, as there are many animals, from the lordly lion, to the skulking rabbit, who shelter themselves in holes, in dens, and in caverns, from the inclemency of the seasons, and from the dangers to which they themselves, and their tender offspring are exposed, from the attacks of their enemies, more especially when in sickness or at rest. Similar apprehensions, it is probable, first gave man a conviction of the necessity there was for shelter; and as such dens and caverns as were formed by nature, would soon be occupied, the idea would thence occur, of erecting the means of shelter and repose in the trees of the forest; then huts made of wood, of earth, or of stone, would be constructed;

fructed; and by progressive improvement, thence would arise the comfortable cottage, the elegant and hospitable rural mansion, and the luxurious palace with all its ornaments and splendor. Habitations would then not only afford shelter from the inclemency of the weather, and safety during sickness and repose, but a variety of other conveniences and advantages would arise from that source of accommodation, more especially the means of using the important article of fuel or heat, through the medium of which, food is prepared to more advantage, clothing is improved in its utility, and in the comfort of using it; and houses themselves, by warmth, and the exclusion of damp, rendered fitter for the habitation of men.

II. *Social Gratifications.*—That man was formed for society, is sufficiently evident. The powers of speech with which he is endowed, the advantages he derives from the assistance of others, the wonderful exertions that can be made, and the objects that can be obtained, by a combination of strength and talents, all prove the necessity and advantages of union. Indeed many of the highest gratifications which man is capable of enjoying, are derived from this source. Among these, the following are by far the most important; namely, those arising, 1. From family connexions or personal friendship; 2. From marriage, or the union of the sexes; 3. From the enjoyment of property; 4. From useful occupations; and, 5. From political institutions.

1. *Family Connexion, and personal Friendship.*—The first social pleasure which it is proper to mention is, that which arises either from family connexion, or personal friendship, for there does not seem to be any material difference between them. In ancient times, the ties of
friendship

friendship were much inculcated, because men were then educated, more as citizens of some particular state, than as members of any particular family. But as a great moralist (Johnson) has well observed, "*relations are ready made friends*;" and an affection for parents, brothers, sisters, and other near connexions, cannot be too earnestly recommended, as, on many accounts, an indispensable and useful duty. That, however, is not inconsistent with a personal regard or friendship for other individuals, unconnected by blood, but with whom, from neighbourhood, from early acquaintance, from being educated at the same school, from professional intercourse, or from a similarity of disposition, of pursuits, &c. an intimate connection may be formed.

2. *Marriage*.—The second source of social pleasure, arises from the union of the two sexes in marriage, which undoubtedly yields superior joy, and more exquisite gratifications, than any that either family connexion or personal friendship can produce. In either of these two latter cases, a separation of interests often takes place, which necessarily occasions jealousy and disputes; but in this, if founded on proper principles, from the close and inviolable union that is established between the contracting parties, there can be none. It is from this connexion also, that those peculiar pleasures can alone originate, which arise from the tender ties of parental affection; the delightful task of rearing up new beings, from infancy to manhood; and the important obligation, of training them to fulfil the various duties which ultimately are required from them. Such indeed are the innumerable advantages, both public and private, resulting from this species of connexion, that the most distinguished statesmen have invariably maintained, that it ought to be in a peculiar

peculiar manner favoured by the laws, as the best foundation of political strength, and of social happiness*.

3. *Property*.—The next source of social pleasure, arises from the enjoyment of property, which is the creature, and undoubtedly one of the most important advantages resulting from the establishment of the social union. If indeed the power of acquiring property had not been confirmed, there would have been no spur to action, nor any incitement to industry and labour †. For who would ever have thought of cultivating the ground for food; of procuring the various articles necessary for clothing; or building the homeliest hut; if, instead of his being invested with the exclusive property of what he had thus created, and the power of bequeathing that property to persons for whom he entertained a peculiar esteem or affection, any other individual might avail himself of his skill and exertion, and seize the possession of them, without his knowledge or consent. In fact, the establishment of property is the great means by which the human species has been ennobled and improved. When that right was com-

* Such was the respect paid to marriage at Athens, that all commanders, orators, and persons entrusted with any matter of public confidence, were obliged to be married men. The Roman laws against celibacy, during the Augustan age, were peculiarly severe.

† I know the high colouring which the poets have made use of in their description of the golden age; representing those days as the only happy ones, when, according to a favourite quotation,

“Mollia securæ peragebant otia gentes,

“Nec domus ulla fores habuit;” &c. &c.

But fiction is the province of poetry; nor is it proper to infringe upon the principal source of all its beauties. It is sufficient to remark, that the injustice of the poets has been amply recompensed by the applause of the best practical philosophers, and the sanctions of the most enlightened statesmen.

pletely established, it was soon found “ that a part
 “ only of society, was sufficient to provide by their ma-
 “ nual labour, for the necessary subsistence of all ; and
 “ leisure was given to others, to cultivate the human
 “ mind, to invent useful arts, and to lay the foundation
 “ of science*.”

4. *Useful Occupations.*—The fourth social pleasure arises from exertion and industry in some useful occupation. Man is naturally fond of action, and cannot feel comfortable, either in regard to his mind or his person, if they be not exercised and usefully employed. Indeed as the numbers of any community multiply, new occupations must be invented, in order to enable persons to acquire an income sufficient to maintain themselves, and to rear up families for the state. One portion of the community will be devoted to the essential occupations of providing food, clothing, and shelter : others will be employed in the magistracy, and in the learned professions, namely, law, divinity, and medicine : others in defending the country either by sea or land : and others in foreign commerce, and in the manufacture of various articles foreign or domestic consumption. Nor are those professions which arise from the refinement and the luxury of a nation to be condemned as unnecessary : not even those which contribute merely to the amusement of the people ; for men cannot always be employed in serious thought, or laborious occupation, but require occasional relaxation and pleasure. Nay, when kept within due bounds, a fondness for music, for theatrical representations, and for the finer arts, and all the employments arising therefrom, cannot be considered as useless, and far less as

* Blackstone's Commentaries, vol. ii. p. 8.

injurious to a great political community; for without the professions attached to the more refined arts, no large city could possibly exist, not being able to furnish a great population with the means of subsistence.

5. *Political Institutions*.—The last source of social gratification, arises from political institutions, and from the personal security, and many other advantages connected therewith.

Among political pleasures are to be enumerated, the happiness which naturally results from discharging the various duties incumbent on the members of any political society; as, inculcating and preserving obedience to the laws; defending the country against foreign enemies, repressing domestic sedition; rewarding and encouraging merit; performing beneficent actions to others, and fulfilling, to the best of their abilities, such other obligations as may arise from the situation in which they may happen to be placed; for instance, if intrusted with the right of choosing legislators, selecting those who are the most likely to promote the interests of their country, or if possessed themselves of any share in the government, having that great object invariably in view.

Unfortunately, however, though political pleasures, at least on a great scale, are in general found the most unsatisfactory of any, yet, from their nature, they are most anxiously sought after, by ardent and ambitious minds, whose great object is, not so much to enjoy true and unfulfilled happiness themselves, as gratify the pride, by possessing authority and command over their fellow-creatures; and to this every thing is sacrificed. No nation however can be completely happy, where political

tical intrigues, and contests for power * are the principal objects of attention. The peace and harmony of the community, is in that case not only disturbed by faction, but it becomes in a manner the interest of one part of the nation, to keep the people in a perpetual state of uneasiness and alarm; to divide them into parties; in many instances to arm them against each other, and perhaps to resort at last to the miserable expedient of calling in a foreign power to assist them in their views. Attention to political matters, is, to a certain extent, necessary in all countries, more especially in those which are free; but when it degenerates into a factious spirit, the pleasures resulting from political institutions, must in a great measure be lost, and the consequences must be fatal to a nation.

III. *Mental Enjoyments.*—The last, and greatest source of enjoyment, of which man is capable of partaking, arises from the exercise of his mental faculties, and the pleasures resulting from religious and moral exertions.

When the great attainments which man is capable of possessing are duly considered, it can hardly be questioned, but that reason and thought, were conferred upon him, for nobler purposes than merely to supply the means of animal gratification, and that the mind or spirit with which he is exclusively endowed, is the most valuable of all his attributes. Deprived of reason, he would differ in nothing but in shape, from the brute

* Could any thing be more absurd, than the wasteful wars carried on in England, for so many years, whether a person of the house of York, or house of Lancaster, should govern the country. The case at the Revolution was extremely different. The contest then was, whether liberty or despotism was to be established in these kingdoms.

creation ; and unless that reason is improved, what a poor and defective animal is man ? He must feel wants, which he knows not how to supply ; he must be deprived of advantages for which he can receive no possible compensation ; were he to enjoy all the animal and all the social pleasures above enumerated, he would still find a vacuity. It is essential for his happiness, therefore, that his mind should be cultivated by means of a proper education, and that every individual, according to the situation in which he is likely to be placed, should be enabled to partake of those mental pleasures to which the human species is entitled.

But above all, man was endowed with reason and thought, in order to contemplate the works of an all-powerful Being, and to prepare himself for eternity. What are the other objects of life compared to this ? The short period, during which a man continues in existence, exposed to dangers, hardship, trouble, and pain, would not be worth possessing, were not this life properly considered, merely a preparation for another. In the most favourable point of view, the life of man rarely exceeds threescore and ten years, of which the first twenty years are spent in childhood, or in the trammels of education, for the purpose of being fitted to enter into society : the twenty years at the conclusion of life, generally form a period of sickness and distress, during which little happiness can be expected ; so that in fact there are but thirty years at the utmost, which can be looked up to by almost any individual, as the period of sublunary happiness : and from these few years how many are the defalcations. What a portion of these is lost, in sleep, in sickness, in the indulgence of improper pursuits, and in suffering under the effects of the jealousy, the enmity, and the malignity

nity of others.—Surely such a life is not sufficient to gratify the wishes of any rational being, and he must derive infinite pleasure from the confident hope, which a belief in the doctrines of the christian religion can alone furnish, that it will be improved and extended in another, and in a better world. In fact, this great object of human existence, the enjoyment of the blessings of eternity, is that which gives a zest and relish to every other. Impressed with such an idea, a man enjoys the pleasures of this life, without feeling any grievous disappointment, when he can partake of them no longer; and he bears with patience, the various troubles and distresses with which he is here afflicted, trusting that he will derive a sufficient recompence, in a future stage of existence.

Such, on the whole, are the pleasures of which human nature is capable of partaking. No individual can expect to possess them all; but that man is the happiest, who enjoys the greatest proportion of them; and that nation is the best governed, where the greatest number of persons belonging to it, find such blessings the most attainable.

Let us next consider, what are the most likely means, of rendering the enjoyments of life as general as possible.

2. *Means of extending the Advantages of political Society, and the Blessings of Human Life.*

Various attempts have been made to improve the state of political society, in different countries, and at different times, sometimes by beneficent sovereigns, or by well-intentioned ministers, who wished to ameliorate the condition of the people whom they governed; and sometimes by philosophers, or literary men, as More,

Harrington, &c. who formed systems in their closets, founded on imaginary doctrines, and consequently incapable of being ever carried into effect. Nor is this to be wondered at: as well might an ignorant and presumptuous individual, attempt to build a lofty and splendid edifice, without any real knowledge of the materials of which it ought to be composed, as the ingenious philosopher, secluded from the scenes of active life, can expect to form a system, calculated for the present state and order of society.

Nor does it appear, that those beneficent rulers, who endeavoured to improve the situation of those they governed, were much more successful. Indeed, how could it be expected, unless they had previously made those minute and extensive inquiries, without which they must probe in the dark, and were as likely to do infinite mischief, as to effect much good. Without a knowledge of facts, connected with any intended alteration in the laws, or in the political establishments of a state, how is it possible to judge whether the change can be brought about, without inconvenience or to much advantage. For the important purpose of legislation, therefore, inquiries on a great scale are essential. Real patriots, and practical statesmen, can be no longer satisfied, with partial and defective views of the situation of a country, but must wish to know the actual state of its agriculture, its manufactures, and its commerce, and the means of improvement of which they are respectively capable;—the amount of the population of a state, and the causes of its increase or decrease;—the manner in which the territory of a country is possessed and cultivated;—the nature and amount of the various productions of the soil;—the value of the personal wealth or stock of the inhabitants, and how it

can

can be augmented;—the diseases to which the people are subject, their causes, and their cure;—the occupations of the people,—in what cases they are entitled to encouragement, and where they ought to be suppressed;—the condition of the poor, the best mode of exciting their industry, and furnishing them with employment;—the state of schools, and other institutions founded for the purposes of public utility;—the state of villages and towns, and the regulations best calculated for their police and government;—and above all the state of the manners, the morals, and the religious principles of the people; and the means by which their temporal and eternal interests can best be promoted.

I know that some political authors have maintained very opposite principles, and contend that matters should be left to themselves, that things will always find their own level, or, in other words, that a government should think of nothing but of war, of foreign intrigues, and of internal taxation: and I am ready to confess, that much benefit cannot be expected from any information thus accumulated, unless the rulers of a nation are not only able men, and well disposed to promote the happiness of the people, but that the frame of the government is such, as to impose proper checks upon those who govern, otherwise almost every information thus obtained, may not merely be lost, but may, in the progress of human affairs, be perverted to the worst of purposes. But the principle that I maintain is this, that as no individual can improve his private property, without knowing exactly its extent, the soil of which it consists, the number of farmers by whom it is occupied, the state of the buildings erected on it, the crops which it is capable of producing, the best means of cultivating it, &c. &c. &c. neither can any government improve a

country, nor better the situation of its inhabitants, without entering into minute inquiries of a similar nature, for the purpose of at least removing all obstacles to improvement. For what is a nation but a great estate? What is a country but a large farm? and the same principles which are applicable to the improvement of the one, must necessarily be calculated to promote the interests and happiness of the other.

If, therefore, a wise and truly beneficent government, were desirous of promoting the happiness of the country over which it is placed, its wishes could not be properly attained, without a laborious and extensive inquiry into the state of the country, and the means by which it might be improved; and if we were to suppose, that the facts necessary to enable any government to judge what measures it ought to attempt, were once collected, it would probably be desirous of having them arranged, nearly in the following order.

The first part would naturally state the *geographical circumstances of the country*, its situation, extent, soil, climate, divisions, advantages natural and incidental, and other points of a similar nature.

The second object would be to ascertain *the population of the country*, comparing the present with the former state of its population, explaining the causes of its increase or decrease in the different districts, pointing out the manner in which the people were divided, according to their sex, age, professions, and other particulars.

The third point would be to discover *how the people acquire the means of their subsistence*, to what extent they depended on agriculture, fisheries, manufactures, or commerce, and what were the indirect sources of income on which they relied.

The next point would naturally be to inquire into *the laws and public establishments of the country*, and to

see how far they were capable of improvement; how the people were governed; what checks there were to prevent bad government or oppression; whence arose the public revenue; how the laws were administered; how the sanctions of religion were observed; how the health of the people was watched over; and what institutions were established for the education of youth, and other public purposes.

There are also many *miscellaneous objects of inquiry* which such a government would be desirous of having under their view, namely, the language of the people, the arts and sciences cultivated by them, their morals, manners, customs, &c.

And if all these important particulars were laid before a wise and beneficent government, in one connected report, drawn up on proper data; permit me to ask, would there be any difficulty for them to ascertain the ultimate object of the whole inquiry, namely, *how the interest of their nation could best be promoted*, and how the general state and circumstances of the people could best be improved?

Deeply impressed with the advantages to be derived from statistical inquiries on the principles above detailed, I was led to engage in a long and extensive correspondence with a most respectable body of men, the clergy of the church of Scotland, by whom, (or by some other correspondent, when they were prevented, by any unforeseen and unavoidable circumstance, from transmitting their reports) I was furnished, without the exception of a single parish, with a minute and particular description of the different districts where they respectively resided. From such an unexampled mass of important information, and from various other authorities which it will be in my power to consult, I trust

I shall be enabled to prepare an account of North Britain, according to the system above sketched out, whence the advantages to be derived from such inquiries will be sufficiently apparent. Fortunate if it should tend to promote the improvement of my native country, but still more so, should it furnish an example, which other nations might be disposed to imitate, and from which the improvement of political society in general, and the happiness of the species at large, might be promoted.

It is only necessary to add, that the great improvements recently made, in the various sciences and arts, can only be attributed to that anxiety for establishing facts, which is a peculiar distinction of modern times. Since science and art have rested, not on visionary theory, but on the sure basis of investigation and experiment, they have been carried to a height, of which anciently they were supposed incapable. It is by pursuing the same method in regard to political disquisitions, by analysing the real state of mankind, and examining, with anatomical accuracy, and almost chemical minuteness, the internal structure of society, that the science of government can alone be brought to the same state of perfection. By such inquiries, when properly conducted, and wisely acted upon, every individual in a great political community, may be enabled to enjoy as much real happiness in this world, as the imperfect condition of human nature will admit; and may indulge the pleasing hopes, of partaking in those superior blessings, which Revelation teaches us, a truly virtuous character will inherit beyond the grave.

The following is the Plan of the Work, which it is proposed to execute, should health and other circumstances admit of it.

TITLE.

Inquiry into the State of Scotland, and the Means of promoting its Improvement; with Observations on the Nature and Principles of Statistical Inquiries, drawn up from the Reports transmitted by the Ministers of the different Parishes, and other Authorities.

CONTENTS.

PLAN OF THE WORK, *containing Observations on the Nature and Principles of Statistical Inquiries, and the Advantages to be derived from them.*

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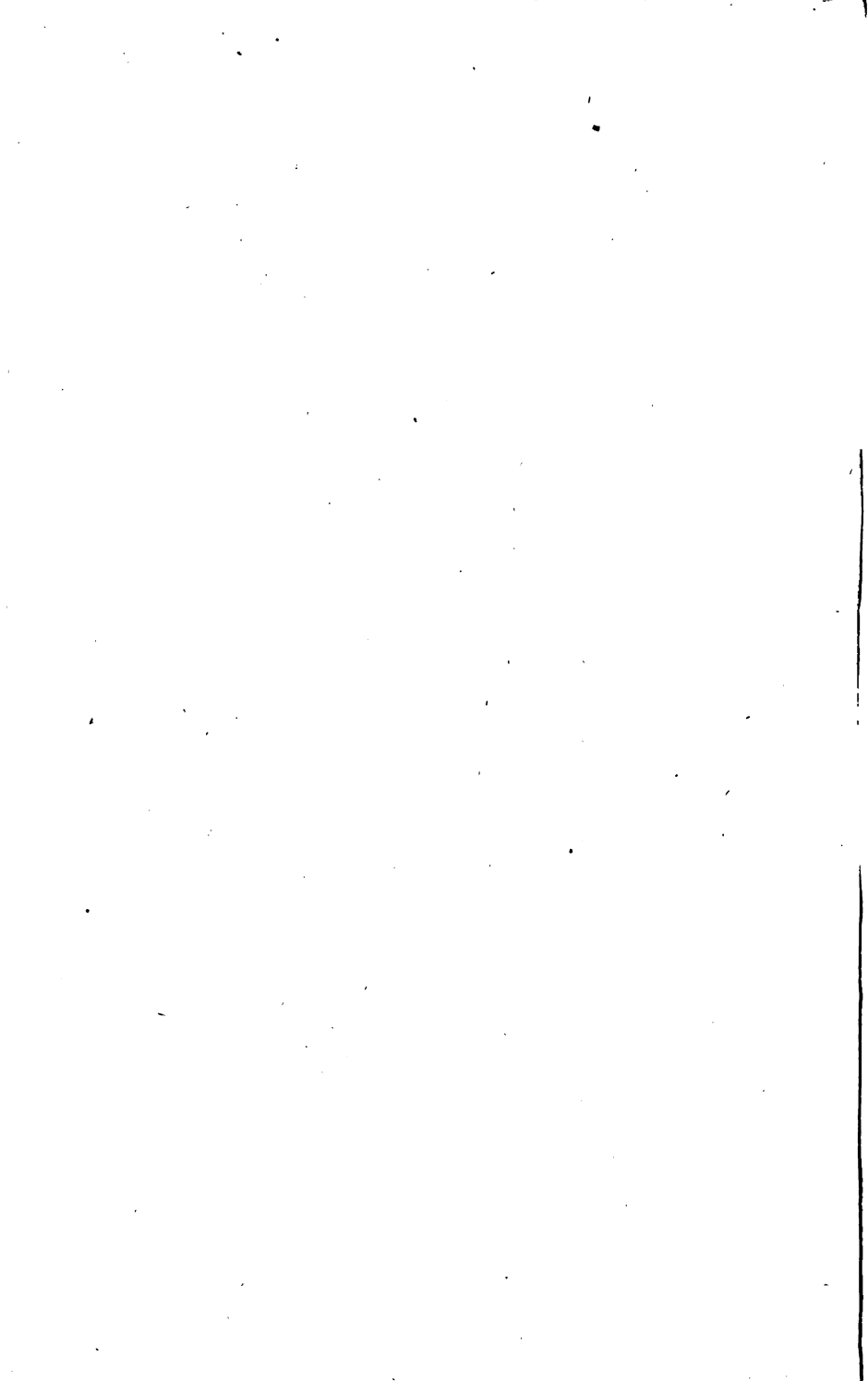
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ESSAY II.

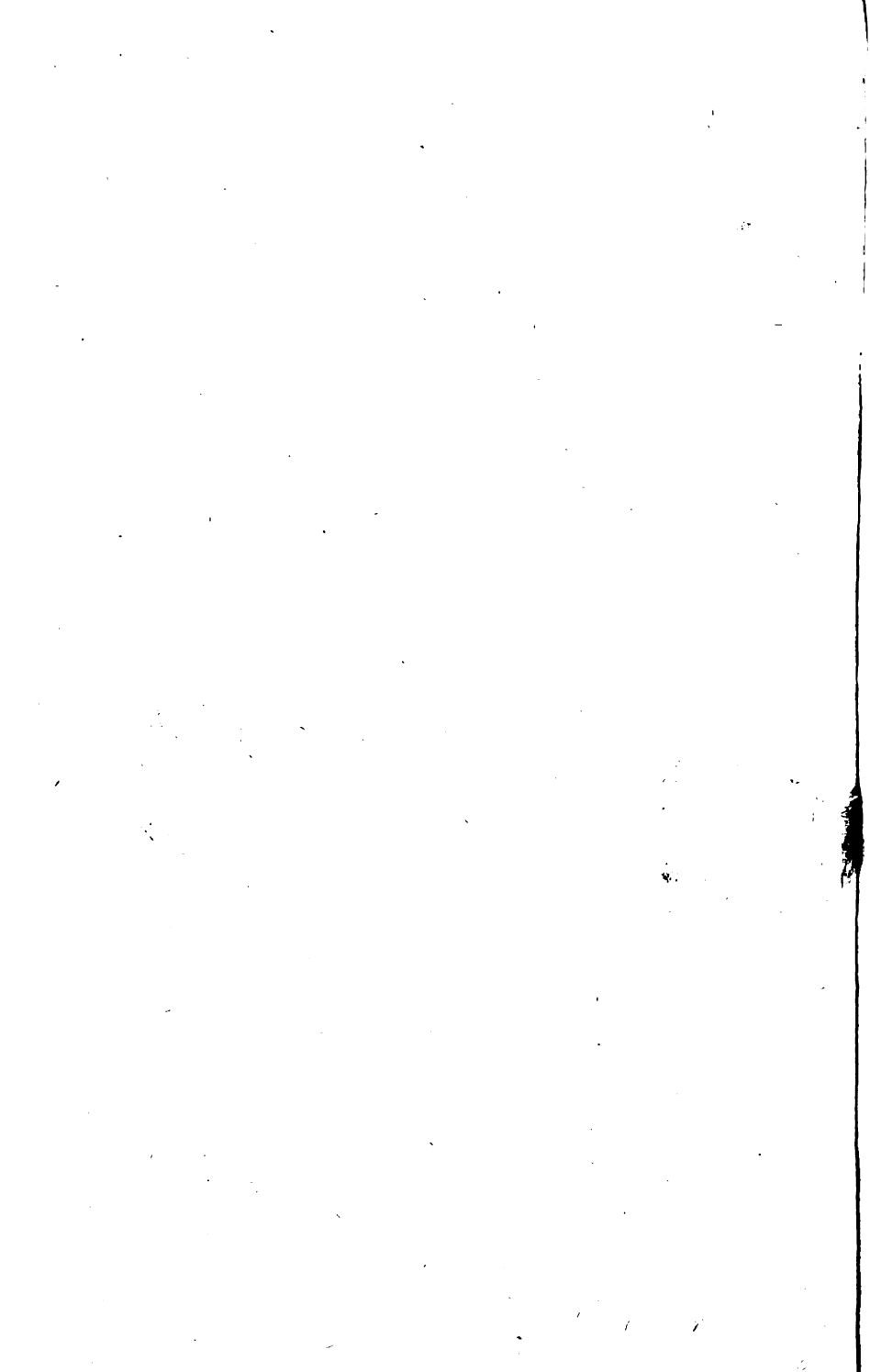
OBSERVATIONS

ON THE MEANS OF ENABLING

A COTTAGER TO KEEP A COW,

BY

THE PRODUCE OF A SMALL PORTION OF ARABLE LAND.



ADVERTISEMENT.

THE following Paper was drawn up for the consideration of the Board of Agriculture, who, in consequence of the observations therein stated, and the great importance of the subject, came to the following resolution :

RESOLVED, (June 9th, 1801,) that a Premium of the Gold Medal, be offered to each of the five persons, who shall, in the most satisfactory manner, prove by experiment, the practicability of Cottagers being enabled to keep one or two milch cows, on the produce of land cultivated with the spade and hoe only, and who shall send to the Board, on or before the 1st of January, 1803, the best accounts of such experiments, detailing,

1. The expence of erecting the cottage, shed, and any other building thought necessary.

2. The expence of providing the stock and tools necessary.

3. The extent of land, and nature of the soil occupied.

4. The expence of digging and fencing the land.

5. The rent, taxes, &c. paid for the same by the cottager.

6. The course of cropping that has been adopted.

7. The quantity and value of each of the different crops.

8. How the cottager and his family are maintained, and how they manage to cultivate the ground, and to harvest the different crops?

9. How

ADVERTISEMENT.

9. How the cow is maintained during the year, and what profit is derived from it?

10. What profit is derived from pigs, poultry, and other articles?

11. How many days they were enabled to labour for other people? and,

12. How, on the whole, the plan has been found to answer?

ESSAY II.

OBSERVATIONS ON THE MEANS OF ENABLING A COTTAGER TO KEEP A COW

BY

The PRODUCE of a small PORTION of ARABLE LAND.

IN several parts of the kingdom, as in Lincolnshire, Rutlandshire, &c. which are calculated for grazing, it is not unusual, to give industrious cottagers, as much land as will enable them to keep a cow, and sometimes two, or more, besides other stock; and it appears from the communications of Lord Winchelsea and others, to the Board of Agriculture, from the publications of the Society for Bettering the Condition of the Poor, and from a late interesting work printed by Mr. Arthur Young *, that such a system is productive of the happiest consequences. It is supposed, however, to be totally inapplicable to an arable district. I trust that such an opinion will not be admitted, without full consideration. Indeed, so far as I can judge, this advantageous system, is to the full as well adapted for the one district as for the other. It requires unquestionably more labour on the part of the cottager, and of his family; at the same time, the occupation of so great an extent of ground is not so necessary in arable, as in grazing, countries; a circumstance, in various respects, extremely material.

* Intitled, "an Inquiry into the Propriety of applying Wastes, to the better Maintenance and Support of the Poor."

In arranging the following plan, (which the reader will please to consider, merely as furnishing an outline to be perfected by farther discussion and experiment), it is proposed to keep in view the following principles :

1. That the cottager shall raise, by his own labour, some of the most material articles of subsistence for himself and his family.

2. That he shall be enabled to supply the adjoining markets, with the smaller Agricultural productions; and,

3. That both he and his family, shall have it in their power to assist the neighbouring farmers, at all seasons of the year, almost equally as well as if they had no land in their occupation.

It can hardly be questioned, that if it were practicable to have a number of cottagers of that description, in every parish, it would promote, in various respects, the interests of the public.

I. *Extent of Land necessary.*

Unless the experiment were fairly tried, it is impossible to state exactly the extent of arable land requisite to enable a cottager to raise the articles generally necessary for the sustenance of himself and family, and to keep a cow, some pigs, and poultry. Much must depend upon the natural richness of the soil (though under the management about to be proposed, almost any soil would, in time, become fertile); on the nature of the climate; on the size of the cow; on the industry of the cottager; on the age and number of his family, &c. But I should imagine, that three statute acres and a quarter, of good arable land, worth from 20s. to 30s. per acre, would be sufficient. It is proposed, that the three acres shall be under a regular course of cropping. The quarter of an acre ought, if possible,

to be converted into an orchard, where the cow might occasionally pasture, and where a pond ought to be kept in good order, that it may have plenty of water at command. Were the land of a quality fit for lucerne, perhaps two acres and a quarter might be sufficient.

II. *Stock and Instruments of Husbandry.*

It is evident, that so small an extent of land, as either two or three acres, under cultivation, excludes all idea of ploughing*, and indeed, unless the cottager shall manage the whole, in the simplest and cheapest manner, there is an end to the whole system. It would require, indeed, four or five acres to keep a single horse, and the expence of purchasing horses, or even oxen, ploughs, and other instruments of husbandry, must be far beyond the abilities of a cottager; whereas with a spade, a hoe, a rake, a scythe, a sickle, and a flail, which are all the instruments really necessary, he is perfectly competent to the management of his little farm.

III. *Course of Crops, &c.*

The three acres, proposed to be cultivated, should be divided into four portions, each consisting of three roods, under the following system of management :

	Roods.
Under potatoes, 2 roods, under turnips, one †	3
Under winter tares, 2 roods, spring tares, one	3

* Ploughs might, perhaps, be hired; but, on the whole, the spade-culture is infinitely preferable, and I would much rather see a cottager hire persons to trench, than to plough for him.

† I would also recommend a small quantity of flax, where the culture and management of the plant was known, to employ the females, particularly in winter, and to supply the family with linen.

	Roods.
Under barley, wheat, or oats - - -	3
Under clover, with a mixture of rye-grafs *	3

Total 12 R.

Other articles besides these might be mentioned, but it seems to me of peculiar importance, to restrict the attention of the cottager to as few objects of cultivation as possible.

It is proposed, that the produce of the two roods of potatoes shall go to the maintenance of the cottager and his family †; and that the rood of turnips should be given to the cow in winter, and during the spring, in addition to its other fare.

The second portion, sown with tares, (the two roods of potatoes of the former year, to be successively sown with winter tares, and the turnip rood with spring tares,) might partly be cut green, for feeding the cow in summer and autumn, but if the season will permit, the whole ought to be made into hay for the winter and spring feed, and three roods of clover cut green for summer food.

The third portion may be sown either with barley, wheat, or oats, according to the soil or climate, and the general custom of the country. The straw of any of these crops would be of essential service for littering the cow, but would be still more useful, if cut into chaff, for feeding it.

* Some recommend the proportion, per acre, to be at the rate of one bushel of rye-grafs, to 12 lbs. of red clover; others 14 lbs. of red clover, to half a bushel of rye-grafs.

† By Sir John Methuen Poore's experiments, it was found, that half a rood, or one-eighth of an acre, produced, for several years, as great a weight of potatoes, as was sufficient for a family of four persons.—Four acres answered for 131 persons.

The fourth portion, appropriated to clover and rye-grass, to be cut green, which, with the assistance of the orchard, will produce, on three roods of land, as much food as will maintain a cow and her calf for five months, namely, from the end of May, or beginning of June, when it may be first cut, to the beginning of November, besides some food for the pigs. It is supposed, that an acre of clover and rye-grass, cut green, will produce 20,000lbs. weight of food for cattle. Three roods, therefore, ought to yield 15,000lbs. weight. A large cow requires 110lbs. weight of green food per day; a middling-sized cow, such as a cottager is likely to purchase, not above 90lbs.; consequently, in five months, allowing 1320lbs. weight for the calf and the pigs, there will remain 13,680lbs. for the cow*. Were there, however, even a small deficiency, it would be more than compensated by the rood of land, proposed to be kept in perpetual pasture as an orchard.

IV. *Mode in which the Family may be maintained.*

It is calculated, that three roods and eight perches of potatoes will maintain a small family of six persons, for about nine months in the year; but, according to the preceding plan, it is proposed to have but two roods under that article; for however valuable potatoes are justly accounted, yet some change of food would be acceptable; and the cottager will be enabled, from the produce of the cow, and by the income derived from his own labour, and from that of his family, to purchase other wholesome articles of provision.

* These calculations are merely given as data for experiment. It must depend upon the season, whether the tares or the clover should be made into hay.

V. *Manner in which the Stock may be kept.*

It appears from the preceding system of cropping, that ten roods of land, or two acres and a half, are appropriated to the raising of food for the cow in summer and winter, besides the pasture of the orchard; and unless the season should be extremely unfavourable, the produce will be found, not only adequate to that purpose, but also to maintain the calf for some time, till it can be sold to advantage. It is indeed extremely material, under the proposed system, to make as much profit of the calves as possible, as the money thus raised, will be a resource, enabling the cottager to replace his cow, when a new one must be purchased.

For the winter provision of the cow, which is the most material, because summer food can be more easily procured, there is the produce,

1. Of about three roods of tares, or clover, made into hay.
2. Of three roods of straw, deducting what may be necessary for litter; and if dry earth be put in the cow's hovel, and removed from time to time to the dung-hill, little or no litter will be necessary.
3. Of one rood of turnips.

The whole will be sufficient for seven months in the year, namely, from the 1st November, to the 1st June; and during the remaining five months, the pasture of the orchard, some of the winter tares, and the produce of three roods of tares, or clover and ryegrass, will not only suffice, but will furnish a surplus for the calf, if it is kept for any length of time*, and some tares or clover for the pigs.

The

* In a pamphlet just published by Richardson, Cornhill, on the culture of potatoes, price 1s. the following mode of applying the refuse potatoes, to the feeding of calves, is strongly recommended.

The inferior barley, potatoes, &c. will of course be given to the pigs and the poultry.

VI. *Value of the Produce.*

The land thus managed, will certainly produce, by means of the extra industry of the family, and at a small expence, a most important addition to the income which the cottager may derive from his ordinary labour. For instance,

	<i>per Ann.</i>
1. The orchard, (after the trees become fruitful,) will probably yield	£ 1 10 0
2. Three roods of turnips and potatoes	4 0 0
3. Eighteen bushels of barley, at 4s.	3 12 0
4. The cow and calf *	7 0 0
5. Hogs	3 0 0
6. Poultry and eggs	2 0 0
Total £ 21 2 0	

Where wheat can be raised instead of barley, the profit would be still more considerable. Opinions

“ Take two gallons of small potatoes, wash them clean, put them into a pot of boiling water sufficient to cover them, and let them boil till the whole becomes a pulp: then add more water, and run the whole through a hair sieve, which will produce a strong nutritive gruel. At first use a very small quantity, warmed up with milk, to make it palatable to the calf, and increase the quantity daily, till it becomes equal. A quart of potatoe gruel, and a quart of scald or skimmed milk, will be sufficient for a good meal, which should be given warm three times a day.”

* According to Mr. Kent's calculations, a cow should produce six quarts of milk per day, worth 1d. per quart, equal to 3s. 6d. a week, or £ 9. 2s. per annum, setting the profit of the calf against the loss sustained when the cow is dry: But it is better to be rather under than over the mark.

will differ much, regarding the value put on each article, but that is of little consequence, as the total cannot be accounted too high.

VII. *Time required for cultivating the Land.*

The quantity of land intended to be cultivated, will not materially interfere with the usual labour of the cottager. It will only require to be dug once, and is then fit to be cropped. It is proposed, that only nine roods shall be annually cultivated, (the remaining three roods being under clover and rye-grafs,) and nine roods may be dug in the space of about 558 hours, or at the rate of 62 hours per rood. This might be done at bye hours (more especially when the family of the cottager shall be somewhat advanced, and consequently more able to furnish assistance); but supposing that the digging, manuring, harvesting, &c. will require twenty entire days per annum, in addition to the bye hours, and allowing sixty days for Sundays and Holidays, there will remain 285 days, for the ordinary hand labour of the cottager, which, at 1s. 6d. per day, would amount to £ 21. 7s. 6d.; the earnings of the wife and children, may, at an average, be worth at least £ 4. per annum more. This is certainly a low calculation, considering how much may be got during the hay and corn harvests: But even at that moderate estimate, the total income of the family will be as follows:

1. Produce of the farm	-	-	£	21	2	0
2. Labour of the cottager	-	-		21	7	6
3. Earnings of the family	-	-		4	0	0
				<hr/>		
Total			£	46	9	6

VIII. *Buildings.*

It is impossible to calculate the expence of building a cottage, as so much depends upon its size, the place where it is situated, the materials of which it is composed, the price of labour in the country, and a variety of other circumstances. On this important subject, much useful information is contained in the first volume of the Communications published by the Board of Agriculture. But it is proper to observe, that no expensive additional buildings will be necessary, in consequence of the proposed system. A shed or hovel for the cow cannot occasion any very heavy charge, and a small barn, of the simplest and cheapest construction, may be of use, not only for threshing the crop, but also for securing the hay, and making it to more advantage, in case the season should prove unfavourable; if the corn is put up in small stacks, the barn may be made of very moderate dimensions.

IX. *Rent, and Balance of Income.*

The rents of cottages, and of land, vary so much in different parts of the kingdom, that it is difficult to ascertain an average. But if the cottage shall be stated at £ 3. per annum, the land at 25s. per acre, and the orchard at 10s. the whole will not exceed £ 7. 15s. The cottager will also be liable to the payment of some taxes, say to the amount of £ 1. 5s. more. Hence the total deductions would be about £ 9. leaving a balance in favour of the cottager of £ 37. 9s. 6d. Considering the cheap rate at which he is furnished with a quantity of potatoes, equal to several months' consumption, and with milk for his children, surely, with that balance, he can find no difficulty, not only in main-

taining himself and family in a style of comfort, but also in placing out his children properly, and laying up a small annual surplus, that will render any parish assistance, whether in sickness, or old age, unnecessary; and thus he will be enabled to preserve that manly and independent spirit, which it so well becomes a British cottager to possess*.

CONCLUSION.

Advantages of the proposed System.

I shall now endeavour briefly to explain some of the advantages which may be looked for with confidence, from the proposed system.

In the first place, the land possessed by the cottager would be completely cultivated, and rendered as productive as possible. The dung produced by the cow, the pigs, &c. would be amply sufficient for the three roods under turnips and potatoes; which would afterwards produce, 1. Tares, 2. Barley, and 3. Clover, with a mixture of rye-grass, in regular succession, without any additional manure. The barley should yield at least 18 bushels, besides 3 bushels for feed, and if wheat or oats are cultivated, in the same proportion. The milk, deducting what may be necessary for the calf, and for the cottager's family, might be sold in its original state, if there shall be a market for it, or converted into butter, for the purpose of supplying the neighbouring towns or villages. Such cottagers also, might certainly send to market both eggs and poultry.

* The different expence of fuel, in the various districts, will, it is evident, greatly affect the annual surplus.

2. It is hardly possible to suggest a measure, more likely to promote the benefit of a numerous and valuable body of people. The system of keeping cows by cottagers, which has been found so advantageous in the grazing districts, may thus be extended over the whole kingdom; and indeed, if the above plan is found to answer, in place of 4 or 5 acres employed in feeding a single cow, it would be much better, even in the grazing counties, to restrict the land to a smaller quantity, under a tillage mode of management; for thus not only the cow, but also the cottager himself and his family, would, in a great measure, be maintained by a less surface of soil.

3. It is of infinite consequence to establish the practicability of this system, as the means of removing a most unfortunate obstacle to the improvement of the country. It is well known to be the only popular objection to the Inclosure of our Wastes and Commons, that, while uninclosed, a number of cottagers are enabled to keep cows, by the means of their common-rights, and that their cows disappear when the commons are inclosed. But if so small a portion of land as $3\frac{1}{4}$ acres, when improved and properly cultivated, can enable a cottager to keep a cow, even to more advantage than with a right of common, which can hardly be doubted, as he is enabled to provide winter as well as summer food, there is an end to that obstacle to improvement. Indeed, if sufficient attention be paid to the principles above detailed, the situation of the cottager, instead of being deteriorated, would be materially bettered by the inclosure; and his rising family would be early accustomed to habits of industry, instead of idleness and vice.

I shall

I shall conclude with asking, if any one can figure to himself a more delightful spectacle, than to see an industrious cottager, his busy wife, and healthy family, living in a comfortable house, rented by himself, cultivating their little territory with their own hands, and enjoying the profits arising from their own labour and industry? or whether it is possible for a generous landholder to employ his property with more satisfaction, or in a manner more likely to promote, not only his own, but the public interest, than by endeavouring to increase the number of such cottagers, and encouraging, by every means in his power, the exertions of so meritorious, and so important a class of the community?

LONDON, *May*, 1801.

Plan of the proposed Cottage Farm, pointing out the Rotation of Crops in the different Lots.

Cottage.	The Orchard, or perpetual Pasture.			(Pond.)
	Lot A. 3 Roods. 1 Year { 2 Roods Potatoes { 1 Rood Turnips		Lot B. 3 Roods. 1 Year { 2 Roods Winter Tares. { 1 Rood Spring Tares.	
	Lot C. 3 Roods. 1 Year—Barley, Wheat, or Oats.		Lot D. 3 Roods. 1 Year—Clover and Rye-grafs.	
The Rotation of Crops for Four Years.				
Year.	Lot A.	Lot B.	Lot C.	Lot D.
1	Potatoes and Turnips	Winter and Spring Tares	Barley, Wheat, or Oats	Clover and Rye-grafs
2	Winter and Spring Tares	Barley, Wheat, or Oats	Clover and Rye-grafs	Potatoes and Turnips
3	Barley, Wheat, or Oats	Clover and Rye-grafs	Potatoes and Turnips	Winter and Spring Tares
4	Clover and Rye-grafs	Potatoes and Turnips	Winter and Spring Tares	Barley, Wheat, or Oats

The rotation then begins as at first. Lot D, might continue in natural grafs the first season, to diminish the labour of that year.

The exact period when the different crops should be dug for, or sown, cannot be ascertained, because it varies so much in different counties; and depends upon the seasons; but according to the above rotation, the labour of digging for the various crops is diversified as much as possible, so as not to interfere materially with the other occupations of the cottager. At no period, would it be necessary for him to dig more than two roods in a month; and both he and his family will labour with much more satisfaction and dispatch when they work for themselves than for another. In case of necessity, the cottager might hire some of his neighbours to assist him in digging, which would be much better than hiring a plough. If it is found that a cottager, under this system, cannot work as a common daily labourer, it might at least answer for labourers by the piece, who are so extremely useful in all countries.



ESSAY III.

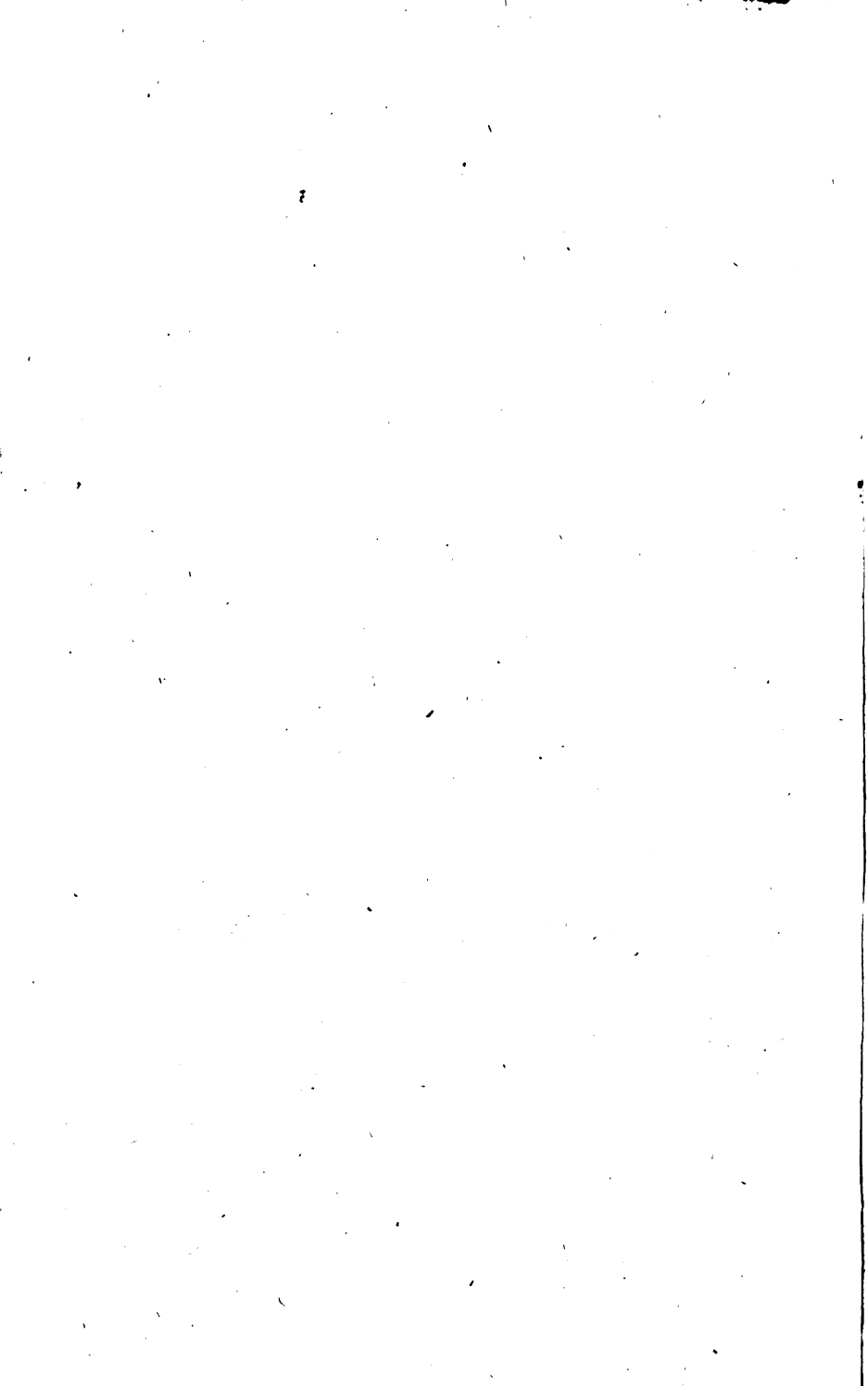
HINTS

AS TO THE

ADVANTAGES OF OLD PASTURES,

AND ON

THE CONVERSION OF GRASS LANDS INTO TILLAGE.



ESSAY III.

HINTS AS TO THE ADVANTAGES OF OLD PASTURES,

AND

On the CONVERSION of GRASS LANDS into TILLAGE,

HAVING corresponded with some intelligent proprietors, and practical farmers, on the important question recommended by the Board of Agriculture, to the attention of the public, namely, “*The Propriety of converting Pasture Land into Tillage,*” I have thought it a duty incumbent upon me, as a Member of the Board, and a well-wisher to the improvement of the country, to communicate the result of that correspondence, as several of the observations transmitted to me on that subject, seemed to be of considerable importance.

I. *Advantages of old Pastures.*

Before, however, the propriety of ploughing up old pastures is discussed, it may be proper, in the first place, to point out some of the most important advantages to be derived from them.

1. The first advantage contended for is, that old pastures answer better for making butter and cheese, than artificial grasses, and the idea is probably well founded. All seeds, particularly clovers, give the
milk

milk a strong taste, and although the quantity may be as great, or even greater, yet the quality is always worse; it will cast up less cream in proportion, the butter is less firm and waxy, and it will not keep so well. The cheese, also, is considerably inferior.

2. It is next asserted, that old pastures are better calculated for feeding cattle and sheep; but this can only be admitted with certain qualifications. In the opinion of that respectable farmer, Mr. *Culley*, (who has had fifty years' experience in the grazing line,) "*Artificial grasses, suited to the different soils, will be found to answer better than old grass, for feeding cattle, ewes, and lambs, during the beginning, and for the greater part of the summer; and even during the autumn, artificial grasses will feed ewes and lambs better than old grass; whereas, on the other hand, fogs (or after-maths, as they are called in the southern parts of England) from old grass, will certainly feed cattle better in the autumn, the richness, luxuriance, and strength of such herbage, being better calculated for their constitutions.*" It is believed, indeed, that it is hardly possible to fatten a large ox, to any degree of perfection, on herbage alone, without such pastures.

3. It is farther contended, that the hay made from old grass, though not so bulky, yet is of a better quality, and will keep longer in a good condition, than hay made from artificial grasses, particularly from a mixture of clover and rye-grass.

H. *Description of the Lands that ought to be kept perpetually in Grass.*

As old pastures are attended with such peculiar advantages, it is desirable to know, what description of land,

land, ought to be kept perpetually in grass. It is certain that there are many old grazing pastures, which can afford to pay a considerable permanent rent in grass, even at a distance from any populous town, the value of which might be reduced, if subjected to the plough. It is the opinion of Mr. Culley, that soft heavy loams, with a clayey or marly bottom or substratum, are universally injured by ploughing. Water meadows also, should never be ploughed, as they furnish so large and valuable a produce in spring, in summer, and in autumn, without any other help than water, whilst the manure made from that produce, goes to enrich the rest of the farm.

With these exceptions, and that of land apt to be overflowed, there is every reason to believe, that old pastures may occasionally be converted, with public advantage, and private benefit, into arable land.

III. *Obstacles to the conversion of old Pastures into Tillage.*

Before, however, the conversion of old pastures into tillage is recommended, it is right to consider, what are the obstacles which may stand in the way of such conversion; for unless they are removed, any recommendation to that effect would be useless. These obstacles are, 1. Tithes, and, 2. The restrictions of the landlord.

In regard to tithes, whilst they continue undefined, they operate, in a peculiar manner, against the conversion of old grass lands into tillage, by depriving both the landlord and the tenant, of so large a proportion of the profit to be derived from it; and as there is every reason to believe, that a very considerable extent of

land in England, is kept perpetually in grass, in order to avoid the payment of tithes in kind, is it not a most unfortunate circumstance, that some means are not thought of for commuting, on equitable terms, a right that operates injuriously to the agricultural interests of the country?

As to the restrictions of the landlord, they are often necessary for the protection of his property. But in the course of the inquiry, it will probably be in the power of the Board, to point out the conditions under which old pastures may be ploughed up, not only without detriment, but with advantage to the landlord, and to the public.

IV. *Preparation of the Soil.*

The preparation for the tillage crops may be considered under three heads: 1. Draining; 2. Paring and burning; and, 3. Manuring.

In regard to *draining*, it should be done effectually, before the land is attempted to be ploughed; for very possibly it may have been kept in pasture, on account of its wetness.

As to *paring and burning*, it is certainly a useful practice, where old grass lands are broken up, for it destroys numberless eggs and larvæ of insects, which are extremely injurious to the succeeding crops, and it almost insures the tenant from any damage he is otherwise likely to sustain from wire-worms, grubs, &c. Indeed where the land is rough, with furze bushes, brambles, ant hills, strong heath, &c. it is hardly to be dispensed with. If the land is so smooth and friable that paring and burning is not necessary, the best plan to adopt is, *to double plough it*, by means of two ploughs following

following each other, the first plough taking off a thin surface of about three inches, and the second going deeper in the same place ; both furrows not to exceed six inches. Mr. Duckett's skim coulter does the work at one operation. This plan is certainly the best to pursue where paring and burning, from prejudice or any other circumstance, will not be permitted.

As to *manuring*, if the land is not to be pared and burnt, lime might be spread on the surface, some time before ploughing, in order to destroy grubs and insects ; but old pasture lands are in general rich enough to be abundantly productive, without dung, until they are about to be laid down into permanent pasture.

V. *Course of Crops.*

The rotation of crops must depend upon the nature of the soil, and the manner in which it is prepared for cultivation.

If the land is pared and burnt early in the season, turnips is the best article that can be sown ; and it is found by experience, that turnips thus raised, will go farther in feeding cattle or sheep, than any other. If it is late in the season before the land is burnt, cole or cabbage may be adopted : if the land is broken up without being pared or burned, early oats will be found the most profitable crop, being so extremely productive on all fresh clean ground. Mr. Culley states, that there are various sorts of early oats, suited for the different soils : for instance, on rich leys of strong loam, *Polish oats* ought to be preferred, of which that sort called *Church's oats*, is by far the best variety. On lighter soils, the *Dutch*, or *Friezeland oat* has been found to answer best : but on the whole, on loamy soils,

no species has been found comparable to the *Potatoe oat*, so called from its having been accidentally found in a field of potatoes, in one of the Northern counties. In regard to the succeeding course, on dry soils, turnips, potatoes, and clover ought to be the prevailing green crops; on mixed soils, beans may be added; and when the mixture inclines to heaviness, cabbages. The following rotation is particularly recommended, on a lightish soil, by Sir Alexander Ramsay; namely, 1. Oats; 2. Turnips, with dung and lime; 3. Barley with seeds; 4. Clover; 5. Wheat; 6. Turnips; 7. Barley and grass seeds; and then to remain in pasture. This intelligent and respectable farmer, is decidedly of opinion, that a complete rotation of seven years is to be preferred to any shorter term. The farmer is thus enabled to profit by his labour, and thoroughly to pulverize and reduce the soil. It may then be laid down in a husbandman-like manner, enriched, and not exhausted, and likely to produce both hay and pasture in abundance and perfection.

VI. *Management during the Rotation.*

When land of a light quality is laid down with turnips, sheep should be folded on them. If the land is strong, or wet, the green crops grown thereon, ought to be drawn, and fed in some adjoining grass field, or in sheds. If the land is in very high health and condition, some farmers would be inclined to cart off half the turnips, and to eat the rest on the ground, though this is not a plan to be universally recommended.

In regard to manuring, it may be proper to observe, that the dung and lime ought to be applied to the turnips, or other green crop, but never to the different sorts of grain.

VII. *Mode*

VII. *Mode of laying down to Grass.*

Grass seeds in general should be sown with the barley, or the crop succeeding turnips, or any other green crop that may be preferred: *the quantity* of grass seeds must be governed by the state and quality of the soil. Old tillage land requires, in addition to the clover, three pecks, or one bushel of rye-grass seed per acre; whereas new-ploughed lands may do with half that quantity, or even less. Heavy lands, if they are to be broken up again in one or two years, require from 10 lbs. to even 20 lbs. of red clover, besides a bushel of the best or Pacey rye-grass; for the seeds are very apt to miss on such soils, except in very favourable growing seasons: but if such lands are to remain in grass, from 4 lbs. to 6 lbs. of marle grass or perennial red clover, and 4 lbs. or 5 lbs. of white, with as much yellow or hop clover, and a bushel of the best rye-grass, will be necessary. If any doubt is entertained regarding the marle grass, from 4 lbs. to 5 lbs. of common red clover may be used in its stead. All dry soils may have from 2 lbs. to 4 lbs. of hop or yellow clover seed per acre, in addition to the white clover seed, and the perennial red clover, or marle grass already mentioned. The following plan is recommended by Mr. Bridge (a respectable farmer in Dorsetshire), for laying down land for permanent pasture; namely, to sow from 6 lbs. to 7 lbs. of white clover, ditto either of marle grass or of common red clover, ditto of hop clover, and one bushel of the best Devonshire rye-grass, which resembles much the Pacey rye-grass. By this means, there is a perpetual feed for five or six years. The hop, clover, and rye-grass flourish early in the spring; the marle grass is in perfection in July, when the other goes off; and the

white clover is in perfection in August, and continues during the remainder of the season. In some meadows of very rich soil, perhaps lucerne ought to be preferred, and it would be of infinite importance to have it ascertained, to what extent that culture could be carried.

As to providing the seed, much must depend upon the character of the tenant, who may often be intrusted with that charge; but if he is too fond of the plough, it is the safest plan for the landlord to provide the seeds, as it must be for his interest to procure the best that can be purchased, to prevent any necessity, from the unproductive state of the grass, to have again recourse to tillage.

VIII. *Increase of Rent.*

It is evident that any tenant would be willing and able to give an increase of rent for the liberty of ploughing up old pastures. What the addition ought to be, must be governed by the situation, the quality of the land, the price of grain, and other circumstances. In Scotland, double rent and upwards, is not unusual on a lease of four years. The earl of Rosebery lately let about 300 Scotch acres of old pasture, at that rate, some part of which produce £ 8. per annum*. It had been pastured, however, for more than sixteen years, and was situated within eight miles of Edinburgh. The high rent payable for such lands in Scotland, may be attributed to the following circumstances:

1. That land fit for tillage, is less abundant in the northern part of the island than in England. 2. That

* Equal to £ 6. 8s. per English acre. In many instances, old pasture land would fetch in Scotland, from £ 8. to even £ 10. per English acre.

old pastures are peculiarly well calculated for producing oats, the general food of the people *; 3. That such lands are in general so rich, as to require but little manure, consequently the manure arising from the crops they produce, may in a great measure be devoted to the improvement of the rest of the farm; 4. That the tenants in Scotland are not subjected to the payment of tithes, nor of poor-rates, or other taxes; and, lastly, That there is either a greater spirit of speculation among the Scotch farmers, or, that they are contented with less profit than the English.

IX. Conditions under which the Liberty of Ploughing may be granted.

But the increase of rent is not the only particular that a landlord has to take under his consideration, when he grants the liberty of ploughing up old pastures. Unless care is taken, when they are broken up, that it is done under a proper system of management, the execution of which is enforced by the strictest regulations, the real value of the property may be materially injured. The conditions, therefore, that ought to be stipulated by the landlord, is certainly not the least important branch of this inquiry.

In considering the general nature of the conditions that ought to be required, I have derived much benefit from perusing the articles which were obligingly communicated to me, by the Earl of Rosebery, and according to which, that noble Lord, in January 1801, let a considerable tract of old pasture land, part of the estate of Dalmeny, in the neighbourhood of Edinburgh.

* It appears from the corn tables, that wheat is almost always cheaper in Scotland than in England, and oats the reverse.

Art. 1. By this article, the fields were to be set up to auction, and the highest bidder was to find security to fulfil the terms he had agreed to.

Art. 2. The grounds were let for four years. 1st crop, *oats*; 2d crop, *turnips or other green crop*; if a naked fallow, four ploughings; 3d crop, *barley and grass seeds*, with two or three ploughings; and 4th crop, *hay*; prohibiting wheat, hemp, flax, &c. under the penalty of £ 10. per acre of additional rent,

Art. 3. The tenant to plough the land properly, to hoe and weed it, &c. to sow with the third crop, at least one bushel and a quarter, or one Scotch firlot of rye-grass, 12 lbs. or 14 lbs. good red clover seed, and 4 lbs. white clover, and sufficiently to harrow, stone, and roll the same, entirely at his own expence.

Art. 4. The tenant to have liberty to cut and carry away the foggage or second crop of grass, in the fourth, or last year, but not to pasture the same *, and to remove every article belonging to him on or before the 1st of November 1804.

Art. 5. The tenant to preserve the gates and fences, to keep the ditches, &c. clear and open, and to leave them in good condition at his removal, and if neglected, the same to be done by the landlord, at the tenant's expence.

Art. 6. The tenant who shall be preferred, to sign a proper deed or instrument, with a sufficient surety, specifying the terms agreed upon.

Art. 7. Accommodation given to the tenant to stack and thresh the crop, under certain obligations, that he shall keep the barn and corn yard in repair.

* This restriction was intended for the preservation of young fences; but where the fields are completely fencible, Lord Rosebery prefers obliging the tenant to pasture the second crop of clover.

Art. 8. An arbiter appointed to determine all differences: the expence attending any dispute to be paid by the person against whom judgment shall be given.

Art. 9. Tenants to remove, without the necessity of previous notice, under certain penalties.

Art. 10. Power reserved to the landlord, or to persons he may appoint, to inspect the fields from time to time, also to work coal and lime-stone, and other stones or gravel, to sink or dig pits, to make roads, and to do every thing necessary for carrying on such works, (allowing to the tenant the yearly value of the ground thus taken up, or rendered usefess,) also, reserving the power of carrying off wood and underwood, paying the damages arising therefrom.

It is evident, that under such prudent conditions as these, if properly enforced, the most cautious landlord may suffer old pasture lands to be converted into tillage, without any material risk of his property being thereby injured.

X. *On the propriety of laying down some of the Tillage Land into Grass.*

Wherever circumstances will admit of it, the landlord will find it for his interest, to lay down the same quantity of old arable land into pasture, that is broken up from pasture and rendered arable, by which change the farm will, on the whole, be much improved, and consequently it is for the advantage of the landlord to consent to the alteration. It is, at the same time, in the opinion of one of our most intelligent farmers (Sir Alexander Ramsay), one of the most difficult operations in husbandry, to lay down old tillage land that has been for years under a ploughing system, (as under fallow, wheat,

wheat, beans, &c.) into permanent grass. One rotation will not be sufficient to produce good pasture; it may be found necessary to have two complete rounds of management, different from what the land has been accustomed to; as, 1. Turnips, cabbages, or summer fallow. 2. Barley, with 12 lbs. of clover and $\frac{1}{2}$ bushel of rye-grass to each acre. 3, and 4. Clover, to stand two years. 5. The clover to be broke up for drilled beans or peas, according as the land is heavy or light. 6. Turnips, with manure; and, 7. Barley, with such grass seeds as are fit for permanent pasture. When the field has gone through these rotations, and in the course of them has been twice manured, it can hardly fail to produce good pasture, more especially if care be taken the first year to feed it off with sheep.

XI. *On the greater productiveness of Arable compared to Pasture Lands.*

Having thus shortly stated the manner in which old pasture lands may be converted into tillage, it may be proper briefly to explain how much the public is interested in such a conversion, in consequence of the much greater quantity of food for man, that is produced by land in tillage. According to Archdeacon Heslop's comparative statement lately published, the weight of food from an acre of arable, on the average of three years, a fallow year being included, is nine and a half times greater than from an acre of feeding stock; and according to the calculations of a very intelligent correspondent of the Board, the Reverend Dr. Walker, of Collington, a Scotch acre of land in pasture, fed with sheep, produces only 120 lbs. weight of meat; whereas the same land will yield 1280 lbs. weight of oatmeal,

oatmeal, or above ten times as much in weight*. This is so important a circumstance, in a public point of view, that it merits particular attention, as it tends to prove, that where one million of people may be maintained by pasturage, several millions may be maintained by tillage, and without any additional extent of ground for working horses, cattle, &c. if the land be cultivated by the spade.

XII. *Conclusion.*

On the whole, though it may not be advisable to recommend the ploughing up of very rich old pastures, or water meadows, or land apt to be overflowed, yet with these exceptions, there is every reason to believe, that other sorts of grass lands may be rendered much more productive, by being occasionally converted into tillage; and for that purpose it is desirable, that the conversion of such lands should be promoted as much as possible; by removing the obstacles to such conversion;—by enforcing the necessity of commutating tithes, without which, no considerable tract of old pasture can be broken up;—by pointing out to landlords the conditions under which they may agree to such a plan, not only without detriment to the real value of their property, but also yielding a most important addition to their income;—and, above all, by explaining to Parliament, and to the public, that the

* If cultivated in whole, or in part, with potatoes, the difference would be still greater. At the same time it is to be observed, that grain will not go so far as meat in the maintenance of man. The proportional difference between the two has not yet been ascertained.

measure above recommended is one which may effectually tend to prevent future scarcities ; and to render this country independent of foreign nations, in the important article of provision.

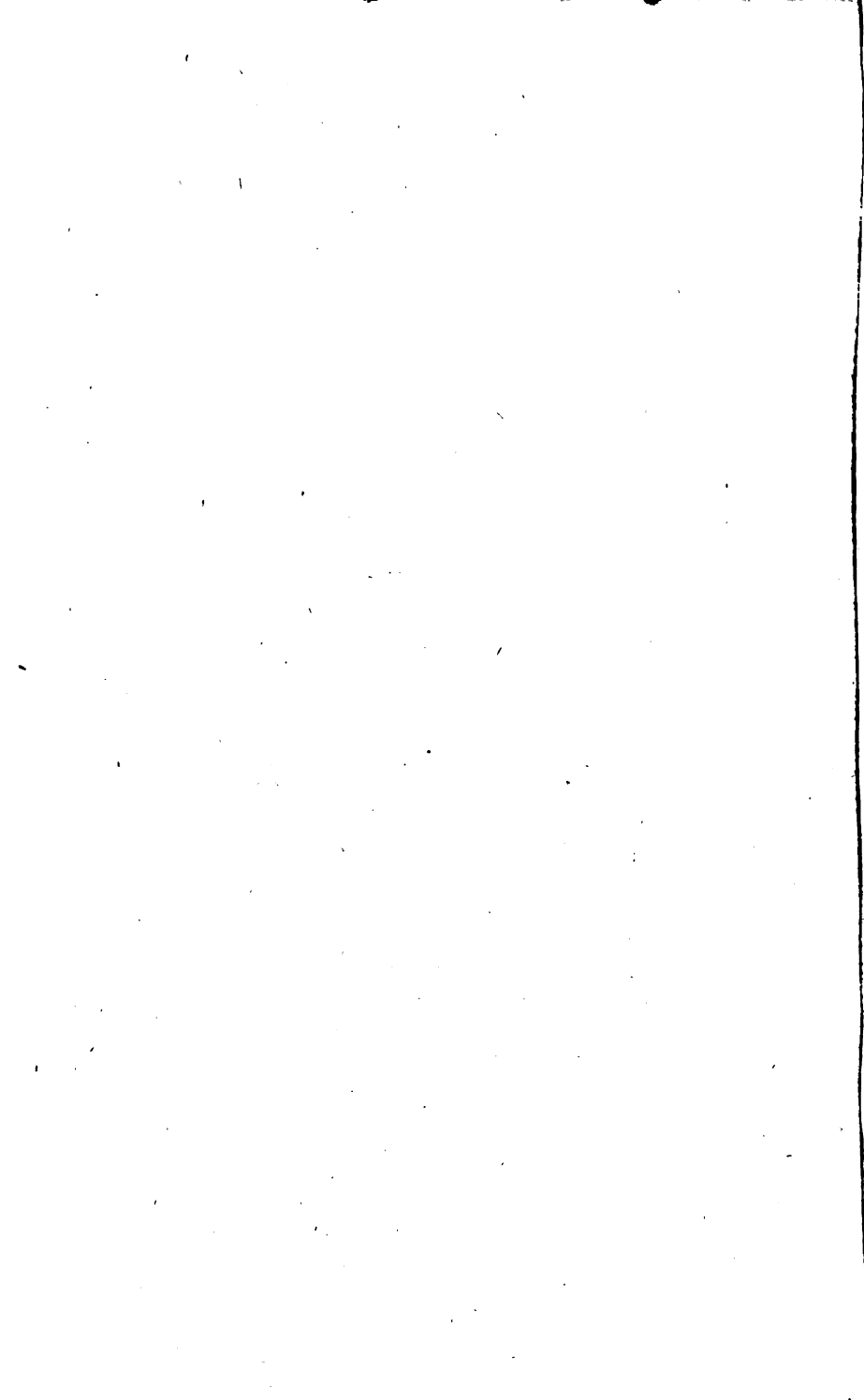
LONDON,
30th March, 1801.

ESSAY IV.

HINTS

REGARDING

CATTLE.



ESSAY IV.

HINTS REGARDING CATTLE.

INTRODUCTION.

THE object that every intelligent farmer ought to have in view, who breeds and maintains domestic animals, is *profit*; consequently he ought to find out, as Bakewell happily expressed it, "*the best machine for converting herbage, and other food for animals, into money.*"

For that purpose, it is necessary to ascertain the shape and nature of the animal which makes the most profitable use of the food it eats: that, however, must depend much on the price of the different articles which the animal produces. For instance, tallow formerly bore a higher price than meat, and consequently was a greater object in the breeding of cattle and sheep than at present, when it sells at an inferior price*. Milk,

* It would be a curious and important subject of inquiry, to endeavour to ascertain the real price, and the relative value, of beef, tallow, and leather, at different periods, more especially within the last century. It is evident, that the farmer must always aim at producing those articles which will yield him the greatest profit; and at present, flesh must be the object; for my butcher informs me, that on the day on which this note is written, (25th Jan. 1802,) beef is sold at 9½d per lb. and tallow at 5½d. per lb. or 3s. 11d. per stone. Flesh consequently is to tallow, as 38 is to 23. It is therefore for the advantage of the farmer, as the market now stands, to produce flesh rather than tallow.

and

and the various articles produced from it, have become so valuable, as to render a good dairy-cow the most profitable of all our domestic animals, and consequently entitled to peculiar attention *. Meat, however, is at present, the object most generally attended to; and it is certain that the breeding of cattle and sheep for the shambles, was never carried to such perfection as it has lately been brought to in England.

The cause of this it may not be improper briefly to explain.

Stock, in general, (and this is still the case in a multitude of instances, and must always be so when the breeder has not food at command, calculated for fattening as well as rearing his cattle,) was formerly bred by one set of men, fattened or prepared for the market by a second, and killed by a third †. Whilst these

* It is much to be regretted that the real value of a good dairy-cow is not more generally known. I am assured by a most respectable country gentleman, (Walter Trevelyan, Esq. of Nether Witton, in Northumberland,) that a well-bred Teefwater cow, will give, on an average, 14 quarts at each of two milkings, or 28 quarts per day. Some of the Teefwater breed, according to Culley, (p. 40,) give even to the amount of 36 quarts per day. But calculating at 28 quarts, this, at 4d. per quart, amounts to 9s. 4d. per day, and in six months to £84. Another intelligent gentleman, who has had great experience in cattle-farming, observes, that any cow, at all calculated for the dairy, will, in seven months milking, pay double her price to the butcher. Take, for example, an Irish or Scotch cow, calving in May, and value the grass she eats at £3.; if she gives from 10 to 12 quarts per day, the farmer will not only be indemnified for attendance, rent, &c. but at the end of the season, he will have the cow for nothing. Can there be a greater inducement to dairy-farming.

† The intermediate occupations of drovers, salesmen, &c. have no occasion to acquire any peculiar knowledge, (excepting as to the state of the markets in various parts of the kingdom,) different from that of the other professions above mentioned.

three occupations continued distinct, with only occasional communications or intercourse with each other, no great improvement could be effected. That division of labour, or separation of professions, so useful in manufactures, was pernicious to this important branch of agriculture, by preventing the principles on which the improvement of our domestic animals might be effected, from being ascertained*.

A person, however, of strong natural sagacity (Robert Bakewell, of Dishley, in the county of Leicester,) though he did not unite to the extent that his disciple, Culley, has done, the two distinct occupations of breeder and grazier, yet having acquired great skill in grazing, by preserving his breeding-stock in the highest possible condition, and having called in to his aid, all the skill and experience which the butcher had acquired, was thus enabled to ascertain the principles, not only of breeding domestic animals, so as to answer the common expectations of the farmer, but also of bringing them to a degree of perfection, of which, before his time, they were scarcely supposed capable: and by directing the public attention in general, and that of the farmer in particular, to the art of breeding, he has in various respects most essentially benefited his country. By his example that most important system was very generally established, of certain breeders directing their whole attention to the rearing of males, and letting them for the season, at such prices as would amply indemnify the breeder for all the care and expence he had bestowed upon them; a practice which had origi-

* But when the properties essential in forming a perfect breed are fully ascertained, the separation of occupations above alluded to, will become useful, as one farm may be better calculated for breeding, another for fattening, &c.

nally taken place in Lincolnshire, but had never been carried to any great height till adopted by Mr. Bakewell.

In discussing the important subject of cattle, it is proper, in the first place, to observe, that a distinct breed of cattle may be formed, 1. In consequence of the soil of the country, and the vegetables it produces; 2. From the climate, which, in various respects, must affect the animals living under its influence; 3. From a particular shape, size, or colour, becoming fashionable, and consequently in great demand; 4. From the nature of the animals that may be imported into it from other countries; and, 5. From the various crosses which have been made among breeds in some respects distinct, and from which a new variety may arise.

It is not proposed, however, to attempt any particular enumeration of the various breeds in these kingdoms; for though differing in regard to colour, size, &c. they claim, in many respects, the same valuable properties. The great object, therefore, to ascertain is, what particulars are essential to form a perfect breed; because if these are once pointed out, there is no sort that may not be improved by attentive breeders, either by crossing with other stock, or by selecting the best specimens of the breed itself, so as to acquire the qualities that may be wished for. These particulars may be considered under the following general heads, namely, 1. Size. 2. Shape. 3. Disposition. 4. Hardiness. 5. Aptitude to feed. 6. Early maturity. 7. Milk. 8. Quality of flesh. 9. Fat. 10. Hide; and, lastly, Fitness for working.

Of the Particulars essential in forming a perfect Breed.

1. *Size.* It is difficult to lay down any general rule for the size of cattle, as so much must depend on the nature of the pasture, and on the means which the grazier has for ultimately fattening them; nor has it yet been proved, by decisive and repeated experiments, whether the large or the small sized pay best for the food they eat. The experiments ought to be made with similar breeds, but of different sizes, and the particulars to ascertain are, whether it does not require a much greater quantity of food, 1. To rear a great ox than a small one; 2. To feed him when working; and, 3. To fatten him afterwards. A large calf certainly requires more milk than a small one, but if it pays as well for what it consumes, or grows in proportion to what it takes, there is no objection, on that account, on the score of profit; nor if a large ox eats more, provided he works proportionally more than a small one. In regard to fattening, the experiments of Lord Egremont are rather favourable to the opinion, that fattening stock do not eat in proportion to their weight, but that a small ox, when kept in a stall, will eat proportionally more, without fattening quicker than a large one.

Without pronouncing decisively on a question so much contested, as whether large or small cattle ought to be preferred, (which will require indeed a great number of experiments finally to determine,) I shall endeavour shortly to sum up the arguments made use of on either side.

In favour of small or moderate sized cattle, it is contended, 1. That a large animal requires proportionally more food than two smaller ones of the same weight. 2. That the meat of the large animal is not so fine

grained, and consequently does not afford such delicate food. 3. That large animals are not so well calculated for general consumption as the moderate sized, particularly in hot weather. 4. That large animals poach pastures more than small ones. 5. That they are not so active, consequently not so fit for working. 6. That small cows, of the true dairy sort, give proportionally more milk than large ones. 7. That small oxen can be fattened with grass merely, whereas the large require to be stall-fed, the expence of which exhausts the profit of the farmer. 8. That it is much easier to procure well-shaped and kindly-feeding stock of a small size than of a large one. 9. That small sized cattle may be kept by many persons who cannot afford either to purchase, or to maintain large ones; and, lastly, If any accident happens to a small-sized animal, the loss is less material*.

In favour of the large-sized, it is on the other hand contended, 1. That without debating whether from their birth till they are slaughtered, the large or the small ox eats most for its size, yet that on the whole, the large one will ultimately pay the farmer as well for the food it eats. 2. That though some large oxen are coarse grained, yet that where attention is paid to the breed, the large ox is as delicate food as the small one. 3. That if the small-sized are better calculated for the consumption of private families, of villages, or of small towns, yet that the large ox is fitter for the markets of large towns, and in particular of the metropolis. 4. Even admitting that the flesh of the small-sized ox is better when eaten fresh, yet the meat of the large-sized is un-

* There is a number of important observations on the size of cattle, in Dr. Anderson's Recreations, Vol. III. p. 1.; and, on the subject of the dairy, p. 161, 241, 325, 405, and Vol. IV. p. 1. and 81.

questionably better calculated for salting, a most essential object in a maritime and commercial country, for the thickest beef, as Culley justly remarks, (p. 47,) by retaining its juices when salted, is the best calculated for long voyages. 5. That the hide of the large ox is of infinite consequence in various manufactures. 6. That where the pastures are good, cattle will increase in size, without any particular attention on the part of the breeder, which proves that large cattle are the proper stock for such pastures. 7. That the art of fattening cattle, by oil-cake, &c. having been much improved and extended, the advantage thereof would be lost, unless large oxen were bred, as small ones can be fattened merely with grass and turnips; and, lastly, That large cattle are better calculated for working than small ones, two large ones being equal to four small ones, in the plough or the cart.

Such are the arguments generally made use of, on both sides of the question; from which, it is evident, that much must depend upon pasture, taste, markets, &c. But, on the whole, though the unthinking multitude may admire an enormous bullock, more resembling an elephant than an ox, yet the intelligent breeder (unless his pastures are of a nature peculiarly forcing,) will naturally prefer a moderate size for the stock he rears; or, perhaps, may adopt that plan of breeding, according to which, the males are large and strong, and the females of a small size, yet not unproductive to the dairy*.

* See Mr. Knight's valuable account of the Herefordshire Breed, Communications to the Board of Agriculture, Vol. II. p. 172. The Herefordshire, Devonshire, and Sussex, resemble each other much in this respect.

2. *Shape* *. It is extremely desirable to bring the shape of cattle to as much perfection as possible; at the same time profit and utility ought to be more attended to than mere beauty, which may please the eye but will not fill the pocket, and which, depending much upon caprice, must be often changing.

As to the shape of cattle, however, breeders seem to concur in regard to the following particulars, to wit,
 1. That the form ought to be compact, so that no part of the animal should be disproportioned to the other.
 2. That the carcass should be deep. 3. Broad; and
 4. That the head, the bones, and other parts of little value, should be as small as possible.

It is evident, however, that the form ought to be adapted, as much as possible, to the wishes of the consumer. For instance; if cattle are to be sold in London, or in other places, where beef for rump-steaks is much in demand, and sells higher than any other parts of the carcass, that is an object to be attended to in cattle bred for the Smithfield, or any similar market, which would not be essential in other counties where no such distinction is made in the meat that is consumed.

3. *Disposition*. It is of great importance to have a breed distinguished by a tame and docile disposition, without, however, being deficient in spirit. Such a breed is not so apt to injure fences, to break into other fields, &c.; and, unquestionably, less food will rear,

* It is a common saying with farmers, "that all breed goes in at the mouth," and it is certain that no animals can be well shaped, unless they are well fed, both in summer and winter. It is almost incredible how much the same breed will improve when they are better taken care of. That, however, ought neither to prevent selection, nor judicious crossing.

support, and fatten them. As tameness of disposition is much owing to the manner in which the animal is brought up, attention to inure them early to be familiar and docile cannot be too much recommended.

4. *Hardiness.* In the wilder and bleaker parts of the country, hardiness of constitution is a most important requisite; and, even where stock is best attended to, it is of essential consequence that they should be as little liable as possible to disease, or any hereditary distemper; as being *lyery*, or black-fleshed*, or having yellow fat †, and the like. It is a popular belief, that a dark colour is an indication of hardiness; and that cattle with light colours are softer and more delicate. A rough pile is also reckoned a desirable property, in a Highland breed; and, above all, in *out-winterers*, as they are called, or cattle kept out all winter, those who will face the storm, and not those who will shrink from it, are in request ‡.

5. *Easily maintained.* It is well known, in the human race, that some individuals eat a great deal, and never get fatter: whilst others, with little food, grow immoderately corpulent. As the same takes place in regard to cattle and to other animals, it is evident how important it must be to ascertain the circumstances which produce a property so peculiarly valuable in them. Bakewell strongly insisted on the advantage of small bones for that purpose; and the celebrated John Hunter declared, that small bones were generally attended with corpulence, in all the various subjects he

* Culley on Live Stock, second edition, p. 43. It is singular that these black-fleshed animals have little or no fat, within nor without.

† See Middleton's Middlesex, p. 576.

‡ It is remarked in the Highlands, that in bad weather, hardy cattle keep their back-bones straight, whereas soft ones bend them, Hence the crooked appearance of bad cattle,

had an opportunity of examining. It is probable, however, that a tendency to fatten arises from some peculiar circumstance in the internal structure of the body ; of which small bones is, in general, an indication ; and that it is only in this point of view that they ought to be considered essential, for they often weigh as heavy, and consequently require as much nourishment as large ones. Small bones, like those of the blood horse, being compact and heavy : large bones, like those of the common dray or cart horse, being extremely porous, and, consequently, light for their apparent bulk. Indeed, cattle ought not only to be easily maintained, in point of quantity, but, in remote and uncultivated districts, in regard to the quality also of the food they consume ; and it is certain, that some particular animals will fatten as well on coarse fare, as others will do on the most luxuriant.

6. *Early maturity.* Arriving soon at perfection, is a material object for the breeder, as his profit must, in a great measure, depend upon it. This is a circumstance, indeed, not only extremely material to the farmer, but, in a populous country, where the consumption of meat is great, to the public also ; as it evidently tends to furnish greater supplies to the market. In regard to this point, however, some wish to make a distinction between sheep and cattle ; as the latter, they affirm, might pay for its keep, by working, or by milk. But is not the farmer indemnified for the expence of maintaining sheep, by the valuable manure it yields, and the fleece which it annually produces, which, when manufactured, is the source of such profit to the community * ?

7. *Milk.*

* In regard to early maturity, both as to sheep and cattle, it evidently depends much on the animal being constantly kept in the best possible

7. *Milk.* The dairy is such an object, in many parts of the kingdom, and it is so desirable to have a living machine that can convert, in abundance and perfection, the food it eats, to so useful, so profitable, and so essential an article, as milk, that the breed the most distinguished for that property, must always be in request. Whether a particular breed ought to be kept up, for that sole purpose, or whether it is preferable to have stock partly calculated for the butcher and partly for the dairy, is a point well entitled to the most deliberate discussion. It is probable that, by great attention, a breed might be reared, the males of which might be well calculated, in every respect, for the shambles, and the females of which might, when young, produce abundant quantities of good milk, yet, when they reached eight or nine years of age, might be easily fattened. This would be the most valuable breed that could be propagated in any country, and indeed some of the best English and Scotch breeds have almost reached that point of perfection.

8. *Quality of Flesh.* The quality of the flesh must certainly depend much upon age and sex, as old cattle must have firmer flesh than young, and heifers must be finer grained than oxen. The excellence of the meat also, must depend much upon the size of the animal, and the food on which it is fattened. On the whole, however, there is no better sign of good flesh than when it is *marbled*, or the fat and lean nicely interwoven, and alternately mixed with each other. Some of the Scotch breeds, (the more northerly in particular) when properly fed, and when they arrive at a proper

possible order, for if it is once suffered to fall back, it requires a considerable space of time, and much trouble and expence, before it can recover what it has lost.

age, enjoy this quality in great perfection ; and hence there cannot be either wholesomer food, or more delicious eating.

9. *Fat.* The advantages, or disadvantages, of fattening cattle and sheep, at least to the extent usually practised at present, is a point that has, of late, attracted much public attention. But any controversy upon that subject must necessarily arise from want of proper discrimination. Fat meat is generally accounted more nourishing than lean ; but then none, except persons in the most vigorous state of health, can digest it : consequently, it is unfit for general consumption. Dr. Willich, in his Lectures on Diet and Regimen, very justly observes, “ that though fat meat is more nourishing than lean, (fat being the cellular substance of animal jelly,) yet to digest this oily matter, there are required, on account of its difficult solubility, a good bile, much saliva, and a vigorous stomach*.” Fat meat also, unless prepared with peculiar care, is apt to lose much in cooking ; but there are modes by which no loss is sustained in dressing it, which remove that objection. For instance, the keelmen of Newcastle purchase great quantities of fat meat. Being generally of Scotch extraction, they follow the custom, so usual in Scotland, of boiling their meat ; the broth of which feeds the family, whilst they themselves eat the meat, generally in a cold state, and in great quantities, and are thus enabled to go through the heavy labour they usually undergo. In many districts, manufacturers and others bake their meat, with potatoes under it, and the fat, melted by the fire, falls upon the potatoes, and

* Willich’s Lectures on Diet and Regimen, third edition, p. 316. Dr. Stark’s experiments go to prove, that three ounces of the fat of boiled beef is equal to a pound of lean. See a tract printed An. 1801, intitled, “ *Practical Economy,*” &c.

improves much their taste, and the nourishment to be derived from them. In either of these ways, little, if any, of the substance of the meat is lost. But according to the usual mode of boiling or roasting fat meat, the loss is considerable, and the meat itself is far from being well calculated for nice or delicate stomachs. The art of fattening animals, however, is one that seems fit to be encouraged, as likely to promote useful knowledge; and although, in the course of trying a number of experiments, some excesses may be committed, yet, on the whole, much advantage must be derived from them.

10. *Hide.* It is well known, that the grazier and the butcher judge of the aptitude that any animal has to fatten from the touch of the skin. When its hide feels soft and silky, it strongly indicates a tendency in the animal to take on meat; and it is evident, that a fine and soft skin must be more pliable, and more easily stretched out to receive any extraordinary quantity of flesh, than a thick or tough one. At the same time, thick hides are of great importance, in various manufactures. Indeed, they are necessary in cold countries, where cattle are much exposed to the inclemency of the seasons: and, in the best breeds of Highland cattle, the skin is thick in proportion to their size, without being so tough as to be prejudicial to their capacity of fattening. It appears, from Columella's description of the best kind of ox, that the advantage of a soft skin is not a new discovery, but was perfectly well known to the husbandmen of ancient Italy.

Lastly, *Working.* It is a most important question, not yet finally ascertained, whether the public, or the individual, gain by working oxen*. In the infancy of agriculture,

* It is ingeniously remarked, that the working of oxen must necessarily increase the number, and only *suspends* the consumption. In

agriculture, when husbandmen had inconsiderable capitals, and little work to do, it might be for their interest to use oxen, as they were cheaper to rear and to maintain, and would always fetch something. But the great farmers of modern times, who have large capitals to act upon and constant occupation for their teams, will generally find it advisable, though they may employ oxen for some purposes, yet, on the whole, to make use of horses. At the same time, the population of a country may increase so much, that the ground must be cultivated, either by the hands of man, as in China, or by animals which man will eat; and the price of beef may become so high as to cast the balance in favour of oxen. On these grounds, it is desirable, that the general breed of cattle in a country should be capable of working. Indeed, as stock ought to produce something, even when rising to their full growth, if oxen are not to be worked, cows ought to be more generally kept, as the produce of their milk is so pro-

survey of Northumberland, by Messrs. Bailey and Culley, some calculations will be found extremely unfavourable to the working of oxen. In fact, it is a general and complicated subject; as the question is not, whether oxen or horses, can be worked at the least expence, but whether by working horses, and feeding oxen, more butcher's meat will not be sent to the market? as oxen, when not worked, may be ready for consumption so much earlier than otherwise can possibly be effected. In favour of oxen, it is to be observed, that a ruminating animal will be served with one-third less food, than another of equal bulk, that does not possess that property. The reason is, that ruminating animals have stronger digestive organs, and every thing capable of being converted into chyle, or nourishment, is extracted from the food. But a horse's stomach is not fitted for this; so that a greater quantity of food is necessary to extract the same nourishment. See White, on the Natural History of the Cow; Manchester Memoirs, Vol. I. p. 442,

fitable,

fitable, unless where pasture is of little value, as in Wales, or the mountainous districts of Scotland and Ireland.

These short hints contain the substance of what has occurred to me on the principles of breeding cattle; and the result is, that cattle ought to be,

1. Of a moderate size, unless where the food is of a nature peculiarly forcing.
 2. Of a shape the most likely to yield profit to the farmer.
 3. Of a docile disposition, without being deficient in spirit.
 4. Hardy, and not liable to disease.
 5. Easily maintained, and on food not of a costly nature.
 6. Arriving soon at maturity.
 7. Producing considerable quantities of milk.
 8. Having flesh of an excellent quality.
 9. Having a tendency to take on fat.
 10. Having a valuable hide; and,
- Lastly, Calculated (should it be judged necessary) for working.

CONCLUSION.

I shall conclude with observing, how desirable it would be, that, under the auspices of the Board of Agriculture, some person were appointed, perfectly competent to the task, and who had leisure to do justice to such an undertaking, to whose care and talents the important task might be committed, of drawing up a detailed system on the subject of cattle. But in order to make such a work complete, more especially that part of it which relates to the diseases of cattle, it would be necessary to collect intelligence, not only from every district

district in these kingdoms, (which might easily be done, by circulating queries for that purpose, and granting premiums to those by whom the best answers were returned,) and also to extract useful information from the writings of Young, of Marshall, and of Anderson, and from the various publications of the Board of Agriculture, but to apply, even to foreign countries for the knowledge they can furnish; and with that view, it would be proper to carry on a regular correspondence with the most distinguished societies in foreign parts, who have directed their attention to rural improvements. By collecting the information and experience of the different countries in Europe upon that, and other subjects of a similar nature, there is every reason to hope that the art, not only of breeding and managing domestic animals, but also every other branch of agriculture, might be brought to a degree of perfection; which otherwise must be unattainable.

APPENDIX.

On the different Kinds of Cattle Farms.

CATTLE farms may be classed under the following heads :
—1. Breeding farms. 2. Dairy farms. 3. Grazing farms.
4. Suckling Farms; and, 5. Farms where cattle are worked.
A few cursory observations on each, is all that the limits of
this paper will admit of.

I. *Breeding Farms.* In breeding cattle, it is proper (if the
size of the farm will permit the rule being observed) to separate
the different ages, and to graze them, as much as possible, in
distinct pastures; as the older ones have a jealousy of the
younger, driving them from the best grass, and sometimes
doing them a material injury.

Bulls will, in general, retain their vigour till they are
twelve or fourteen years old, and there are instances of their
being kept till they are even nineteen years, but they are cer-
tainly in their prime from three to six. They ought to be kept
in one field, which prevents their rambling; and the cows
should be brought to them. But it is still a better plan to
work the bulls with the oxen, as the owner has thereby the
profit of their labour, and all risk of their doing mischief is
prevented.

Mr. Bakewell used to put off sending his heifers to the bull
till three years old, but his cows often missed calf, which might
be owing to that circumstance. It is better, therefore, to send
them to the bull at two years old, and some recommend
strongly even an earlier period*. In the northern counties,

* It is said that young cows, as early as even one year old, might
be sent to the bull. If this would not stint their growth, (which
good feeding might obviate) it might be adopted in particular cases
where the dairy was an object, but certainly ought not to be a ge-
neral practice.

they wish their cows to calve when the grass is abundant. This, it is supposed, opens their milk vessels, and is a great means of rendering them ever after good milchers; which is not the case, unless nature is early made to have a tendency to that species of secretion. It has been found a good plan to give the whole of the milk a young cow yields to the calf, which she readily does, and thus gets into a good habit of milking.

Bull calves* are generally nursed by the mother, but sometimes by hand. It is said that Mr. Bakewell had two nurses for some of his favourite stock. On the other hand, in the north of England, where rearing a number of cattle is the object, they sometimes put two calves to one cow. Hay tea † is sometimes given them, and eggs in spring, when they are cheap; but linseed is the best substitute for milk. The calves are served with linseed twice a day, at the rate of an English pint of linseed, and twelve quarts of milk, for twelve calves, which, with thirty-six quarts of water, is boiled into a jelly; a gallon of this soup is given to each calf, twice a day. The linseed should be crushed.

II. *Dairy Farms.* The proper management of the dairy is a most important source of profit, in many parts of the kingdom, and perhaps ought to be extended to many districts where it is at present but little known ‡. In the neighbourhood
of

* It has been remarked, that if a cow goes beyond her time, she generally produces a male calf.

† The following receipt for making hay tea has been tried with success in the north of England. Take a large handful, or about 1 lb. of red-clover hay well got in, and six English quarts of clear spring water; boil the hay amongst the water, until it is reduced to four quarts; then take out the hay, and mix 1 lb. of barley, oat, or bean-meal, amongst a little water: put it into the pot, or cauldron, whilst it is boiling; keep the whole constantly stirring, until it is boiled and thickened. Let it cool, to be luke-warm; then give it to the calf, adding as much whey as will make a sufficient meal. This is a cheap mode of rearing calves, and may answer the purpose as well as more costly ingredients. In this way the valuable article of milk may be saved for other purposes.

‡ I regret much to hear, that in many parts of England the advantages of the dairy are not so well known as they ought to be; and

of a town, the sale of the milk is, probably, the great object in keeping cows; but in the more remote parts of the country, if calves are not fattened, cheese and butter being so easily preserved and transported, are the proper articles to attend to, with the view of domestic consumption, or of foreign export.

The points to be principally attended to by any person who sets up a dairy, are, 1. To get a proper breed of milk cows. 2. To procure an attentive and skilful dairy-maid; as the whole success of the undertaking must depend on her good conduct*. And, 3. To ascertain whether the milk produced by the pastures in his possession, is best calculated for making butter or cheese.

The proper hours of milking, and how often per day cows ought to be milked, are points of considerable importance. It is certain that some cows require being milked thrice a day, in the prime of the season; but as a general rule, it seems to be most advisable to milk but twice a day, at six o'clock in the morning, and six at night. In this way, a cow has twelve hours each time to graze, or feed, and to prepare the milk for the pail. When they are milked thrice a day, it occasions much unnecessary trouble to the dairy-maids, not only in going to the cows, but also in preparing their vessels for holding the milk, unless they have an extraordinary number of them: it

and that the lower orders of the people cannot get a little milk, or butter-milk, for their children. I wish much to call the attention of the liberal and public-spirited country gentlemen, to a circumstance so important to so numerous a class of the community. The best remedies are, to have small dairy farms in the neighbourhood of all villages, bound to furnish the inhabitants with milk, at a moderate price; and if the Irish mode were adopted by the English farmers, of churning *all the milk*, instead of the cream alone, such a supply of excellent butter-milk would be procured, as would be of infinite service to their neighbourhood.

* Good dairy-maids are so extremely scarce in many parts of the kingdom, that it would be proper to encourage them, by premiums at present applied for purposes much less essential.

also puts the cows from grazing, and diminishes their time for rest*. The dairy-maid should take special care to treat the cows with as much gentleness and kindness as possible, to prevent their taking any dislike to her, which would hinder their milking well; and should milk them *completely*, by which cows are prevented from going so soon dry, as otherwise may be apprehended.

The usual process of making of butter and cheese, and the purposes to which the whey may be applied, are so well known, that it is unnecessary here to describe them †.

Cows.

* Since this was written, I have perused Dr. Anderson's *Recreations*, Vol. III. p. 248, 249, &c. in which there are a number of valuable hints on the subject of the dairy, and in particular regarding the times of milking, respecting which there seems to be a degree of doubt, which nothing but careful and judicious experiments can properly remove.

† The following particulars may be worth preserving in a note. Though fresh butter must be made with great care, yet salt butter requires, if possible, still greater attention, as it must be calculated for preservation; and though salt is indispensable for that purpose, yet if the butter is properly prepared, and the salt properly mixed, the quantity required is not considerable. It is said that the butter made in the months of May, June, July, and August, is the fittest for salting; and that butter made in the latter part of the season will not take salt so well. In regard to cheese, in order to make it rich, they sometimes mix fine tallow with it, and sometimes butter: the latter mode is practised in the northern parts of Scotland. Sometimes also, farmers, in the northern parts of England, make what are called *egg cheeses*, which are famous for toasting. After the curd is thoroughly prepared, they make this cheese, by putting five yolks of eggs to every pound of curd, mixing the whole properly, and putting it into the cheese-press as usual. As to whey, it is sometimes used for making butter, sometimes for feeding swine or calves, and sometimes prepared in the north of England, in the following manner. The whey is put into a kettle or pot on a smartish fire, and when it is near boiling, some butter-milk is put into it, which is skimmed off, as soon as any curd seems to be formed on the top of the whey, some butter-milk is then again put in, and so

on,

Cows are not at their prime state for milk until they are six or seven years old, and they will remain so until they are twelve; but as the older they grow, the worse they will fatten, some farmers begin to feed them, when they are from eight to ten, even though they are good milchers. The propriety of this system, may, however, be questioned. Whilst the value of the udder, in a good dairy cow, exceeds the value of the cow, her pasture, and the necessary attendance, she may be kept to any age. The teeth, not the stomach, fail; and therefore, as long as a cow milks well, she ought to be kept, as she can always be fattened by soft meat.

It has been remarked that some cows will give a large quantity of milk, yet will yield little or no butter; and that a mixture of it will even prevent the cream of the other cows from churning. This is owing either to the animal being in an unhealthy state, or to a predilection for particular kinds of herbage, not favourable to the production of good milk.

III. *Grazing Farms.* Some intelligent graziers recommend the following mode for feeding and fattening cattle. Suppose there are four inclosures, of from six to ten acres each, one of them should be kept quite free from stock till the grass has got up; and then the prime or fattening cattle should be put into it, that they may get the best of the food; the second best should then follow; and the young store after all, making the whole feed over the inclosures in succession, as follows:

1. Inclosure. *Free from stock, till ready for the best cattle.*
2. Ditto. *For the best cattle, till sent to No. 1.*
3. Ditto. *For the second best, till sent to No. 2.*
4. Ditto. *For the young cattle, till sent to No. 3.*

No. 4. is then kept free from stock till the grass gets up, and it is ready for the prime cattle.

on; from time to time, as long as any curds will arise. This substance is called *whey curds*, may be eat with cream or milk, and is not unpalatable diet. The whey that remains from this curd, is commonly called *wbig*, and when kept until it is four, and two or three sprigs of mint put into it, many are of opinion that it makes a pleasant liquor, particularly in hot weather.

The proper size of inclosures has never yet been ascertained by experiment; probably from ten to thirty acres the best, but the size should be various, as small ones are best in winter, and large ones in summer; and small ones are best calculated for grass, and large ones for corn. Mr. Bakewell was a friend to small inclosures. Probably the best plan to adopt is, to feed cattle entirely in the house, or *soiling* them, as it is technically called. In that case small inclosures must be preferred, as the shelter they afford is extremely favourable to the growth of herbage.

In grazing cattle in the fields, two practices are recommended. 1. When hay is given them, or straw, instead of throwing it on the ground, which tempts the stronger to drive away, and even to gore and hurt the weaker; it is better to place it in small square palings, according to the number of cattle in the field, so that each may have a distinct side to go to, without interfering with his neighbours. 2. When cattle are kept out during winter, it is a useful practice to rub some tar at the root of the horn, which hinders any wet from getting between the root and the skin, and it is said contributes to preserve the health of the animal, and to prevent various diseases to which it may otherwise be liable.

The larger a bullock is, he must take the more food to support him. It is desirable to change his food often, and to give him frequently, but little at a time, which makes him more eager to eat. After his kidneys are covered with fat, he will take less meat every week. It is better therefore to ascertain the quantity he eats by the week than by the day.

Fatting cattle to be sold immediately from the farmer's house, and not sent to market, should be kept moderately warm. If kept too hot, it makes them perspire, and their skins to itch: this vexes them, and they rub themselves against any wall or post within their reach, which is much against quick feeding. Currying and combing them are useful practices; and washing them at least once a week, is of great service. Bleeding is now exploded, as an old and unnecessary practice.

IV. *Suckling Farms.* In some parts of the kingdom, the whole attention of the farmer is dedicated to suckling, or, in other words, to feeding calves for supplying the market with veal. In Essex this plan is reckoned more profitable than the dairy, and next to grazing. But the profit there must depend much upon the immediate neighbourhood of that county to so great and certain a market as London.

The particulars connected with this branch of rural economy, will, it is probable, be fully detailed in the Improved Agricultural Survey of Essex, in so far as regards that and the neighbouring districts. But as the mode of suckling adopted in some parts of Scotland is extremely different, it may not be improper to give a short account of it in this place.

As soon as the calf is dropped, it is put into a box made of coarse boards, $4\frac{1}{2}$ or 5 feet long, and 4 or $4\frac{1}{2}$ feet high, and about 2 feet wide, according to the size of the calf. The boards are not put so close but that a sufficient quantity of air is admitted; light is however, carefully excluded, and the box has a cover for that purpose*. The box stands on four feet, which at one end are four inches high, but at the other only two inches, and as there are holes at the bottom, all wetness is drained off. The bottom is also covered with straw or hay, which is changed twice a week. For seven or eight days, milk is but cautiously given, for unless a calf is fed moderately at first, it is apt to take a loathing to its food. It should be bled in about ten days, and afterwards as much milk given it, fresh from the cow, either twice or thrice a day, as it will take. The bleeding should be repeated once a week; and at all times when a calf loaths his milk, and does not feed well, bleeding ought to be repeated. These frequent bleedings prevent diseases from plethora, to which calves are

* All animals, when fattening, ought to be excluded from light as much as possible, as the best and safest mode of keeping them quiet; and infinitely preferable to soporific drugs which are commonly given them. Exclusion from light, is practised by those who fatten poultry for the London market, with much success.

subject, even when not fed so high, and still more so when they are. A large piece of chalk should be hung up in the box, which the calf will lick occasionally: this contributes nothing to the whiteness of the veal, but it amuses the animal, and corrects that acidity in the stomach, which might otherwise be engendered, and which certainly often takes place. A cow calf is reckoned the best for veal: if a bull calf is suckled, he ought to be cut when about a week old, otherwise the veal will neither be so good nor so white. By this mode of treatment, calves are kept clean, quiet, warm, and dry; the veal they furnish is excellent, and they are soon ready for the market*; and on the whole it seems to be preferable to the practice of stupifying them with spirits, or with laudanum, so common in other places, where a different system is pursued.

V. *Farms where Cattle are worked.* The supposed necessity of beginning to feed oxen at an early age, is a great objection to their being generally used, as they are hardly trained properly to work, before it is thought necessary to fatten them, after which they do very little work: but in consequence of the improved mode of fattening by oil-cake, &c. there is no difficulty to fatten oxen, even at twelve years of age, which is a material circumstance in their favour.

It is thought best to begin to break in oxen at three years old, and to give them full work at four. In the northern counties of England, four oxen are commonly used, the two foremost in harness, the other two in yokes. In Scotland it is not uncommon to work two oxen in harness, and without a driver. They are sometimes worked till they are from eight to ten, and even twelve years of age: but it is generally considered to be more profitable to begin to feed them earlier.

* Statistical Account of Scotland, Vol. VIII. p. 199. Vol. IX. p. 384, and in particular, Vol. XIX. p. 495, where an account of this mode is given, by a respectable country gentleman, Mr. Paterfon of Castle-Huntly.

Some people prefer free martins *, and spayed heifers, for working, to oxen. They are found very strong and active, and it is said they will, with equal feeding, work nearly as well as a horse.

It is a remark of the late Sir Charles Turner, that the advantage of working oxen depended much upon the breed; and he preferred much the Lancashire sort, as they were not only active and hardy, *but lengthy in the carcass*, which enable them to go four inches further each step, than almost any other kind.

They have much experience in working oxen in the East Indies; for, besides what are used in husbandry, great numbers attend the armies on all expeditions, for the purpose of dragging the artillery, and conveying ammunition, baggage, and provisions. It is observed in the East, that small oxen will travel much faster than large ones, and will bear more fatigue. Light oxen, with little food, will continue to work until they fall down, but the heavy ones will do nothing unless they are well fed. The heavy ones are stronger, but they are generally slow and surly, and can hardly be made to exert themselves on any occasion. It is also remarked in the East, that oxen ought never to be worked when their bellies are full, nor should water be given them, either on a march or when they are at work, if the weather is hot.

I cannot conclude these cursory hints, without adverting to a most interesting subject, namely, the diseases of cattle, and the means of their prevention or cure, inquiries regarding which are so well entitled to public attention and encouragement, instead of being left, as hitherto has been the case, to the desultory exertions of private individuals. The stock of domestic animals in a country, is one of the principal sources of its wealth; and every circumstance that materially tends to diminish their number, or to decrease their value, must be attended with much public loss. Animals are in general sub-

* Free martins are cow calves cast at the same time with bull calves, which are never known to breed.

jected to much fewer disorders than men, and as their diseases are of a much less complicated nature, they are consequently much easier relieved. There can be little doubt, therefore, that very moderate public encouragement would be the means of discovering those remedies that would be found the most effectual for their removal. Is it possible for the public money to be better bestowed? It is said that a very effectual remedy for the rot in sheep *, has been discovered in Holland, yet no pains are taken to procure a knowledge of it in this country, though that disease has occasioned the loss of many millions of property to the subjects of Great Britain within these fifty years past. If that loss had not been sustained, would not the wealth of the country have been considerably augmented, its public revenue consequently increased, and of course great quantities of human food have been preserved from destruction, which have perished, to the manifest injury of the nation?

* An intelligent correspondent informs me, that it is a custom with some farmers, to pasture their sheep on ground abounding with broom, for several days, when the broom is in blossom, which they find from experience, prevents the sheep so pastured from being infected with the rot for that season.

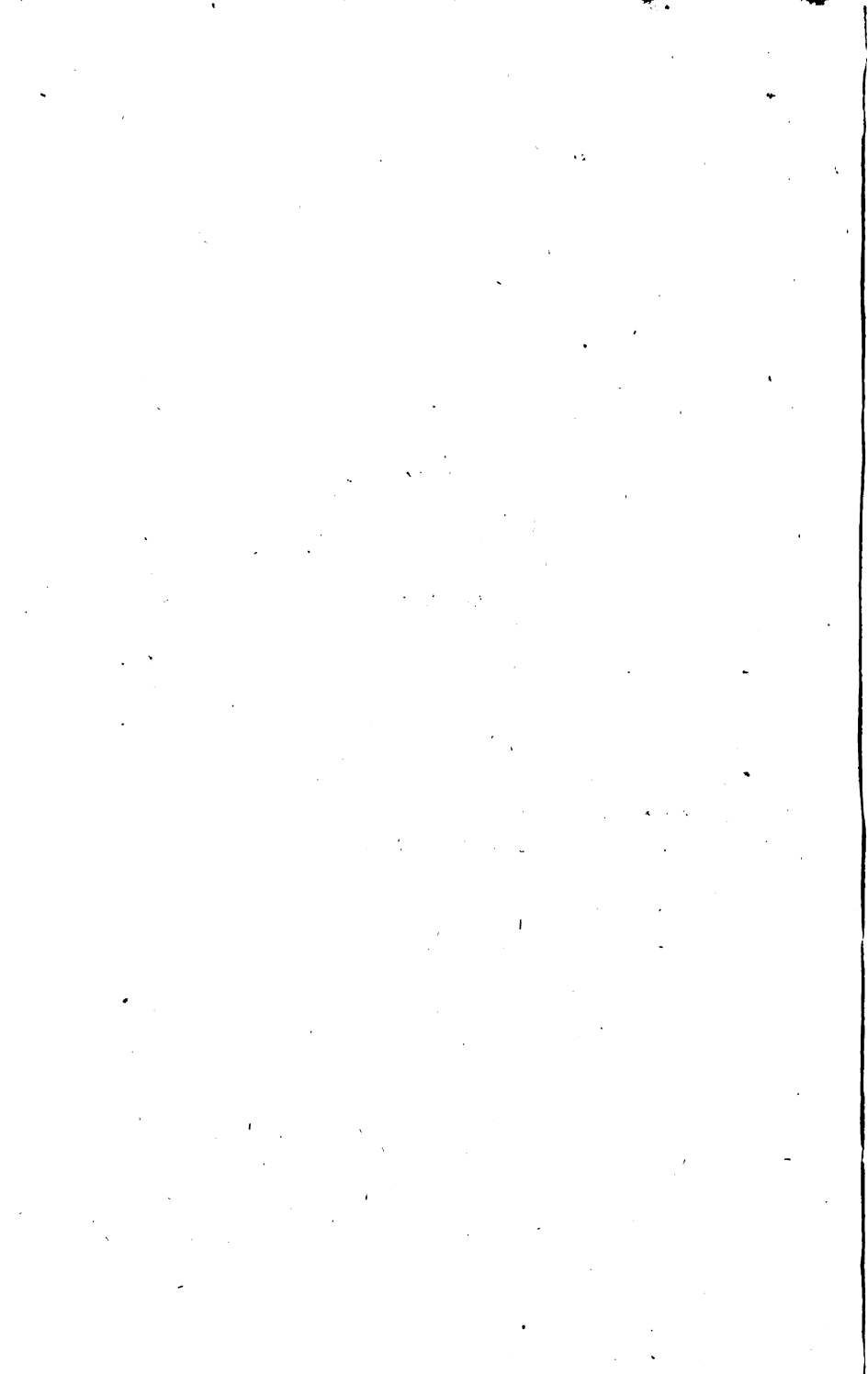
ESSAY V.

ON THE

IMPROVEMENT OF BRITISH WOOL;

CONTAINING

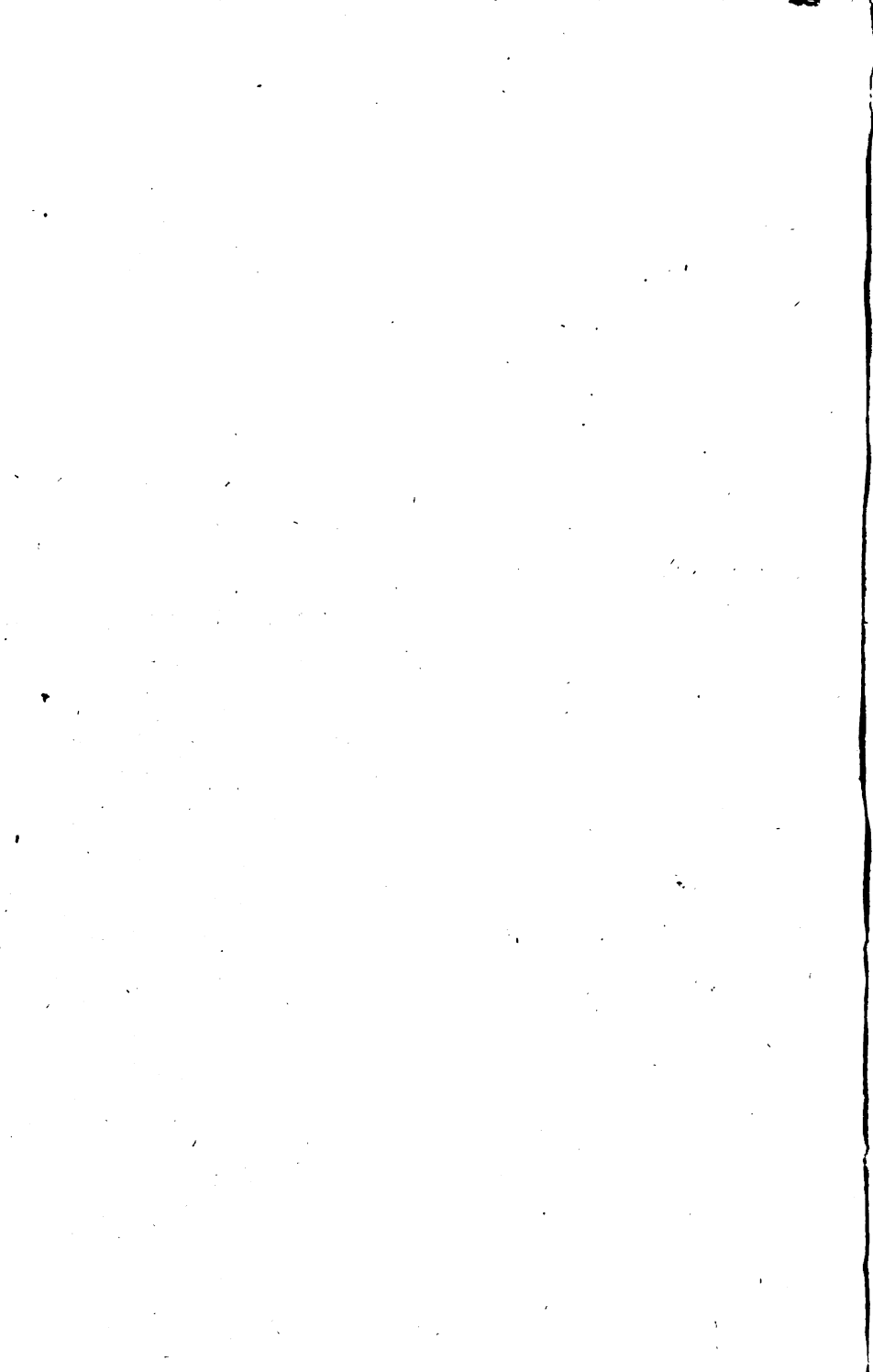
**THE SUBSTANCE OF AN ADDRESS TO A SOCIETY, CONSTITUTED
AT EDINBURGH FOR THAT PURPOSE, ON MONDAY,
JANUARY 31, 1791.**



ADVERTISEMENT.

THE following Paper was rather hastily drawn up, and is, in every point of view, a defective performance. But the Society to whom it was read, being of opinion, that the publication of it might diffuse a spirit of investigation and experiment, and a zeal for the improvement of wool, in the country at large, the Author could not refuse his concurrence to any measure, that could possibly tend to promote such desirable objects. It is now reprinted, with some alterations which a further investigation of the subject necessarily pointed out.

LONDON,
30th March 1802.



ESSAY V.

ON THE IMPROVEMENT OF BRITISH WOOL;

CONTAINING

The Substance of an ADDRESS to a SOCIETY, constituted
at EDINBURGH for that purpose, on Monday,
31st January, 1791.

GENTLEMEN,

AS it is proposed on the anniversary of this day, that a regular account shall be drawn up, of the progress made by the Society in the important object which it has undertaken, that of improving, and it is to be hoped of bringing to perfection, the most valuable production of which the country boasts, it may not be improper, on the first day in which we are assembled, to trouble you with some observations, tending to point out the many public advantages which may be derived from this institution. It is a circumstance which ought more particularly to be dwelt on, that, though the commerce of wool is the most ancient which history records, though in former times Kings were shepherds, and females of the highest rank were anxious to display their dexterity at the distaff; and above all, though it is well known that no country ever acquired great commercial opulence, without carrying the manufacture of wool to a very high degree of perfection, yet, strange to tell, there is not in this, nor I believe in any other country in Europe, a single individual (M. D'Aubenton in France alone excepted) who has paid that attention to
this

this important subject to which it is so well entitled, or at least who has ever acquired such an universal theoretical and practical knowledge of it as would be desirable. Particular *breeds* of sheep, if I may be allowed that expression, have been brought to great perfection in England, and in other countries: Many individuals also have shewn great knowledge of the natural history of this valuable animal, and have collected information respecting the different kinds which exist in various parts of the world: Much practical knowledge has been acquired by shepherds tending their flocks at different times and various places: In Spain, a very curious system, for the management of flocks, adapted to the peculiar nature of the country, has been formed: But, as far as my information reaches, all the experiments which are necessary for precisely ascertaining the effects of climate, food, or management, have never been made; nor is there any work published upon this subject which can sufficiently guide the unskilful shepherd how to manage, and still more how to improve the fleecy store with which he is intrusted.

This circumstance is perhaps owing to the prejudice, that, in regard to sheep, climate is every thing, and that we are fighting against nature, when we attempt to bring the animals or the productions of one country into another. This absurd and dangerous tenet cannot be too loudly reprobated. Were Great Britain at this moment confined to those particular articles which its soil naturally produced, many of the most valuable productions of its fields, and almost all the productions of its gardens, would never have existed here, and this island could never have been able to have fed one half of its present inhabitants.

Indeed, so far is climate from being an objection, that
its

its effects on that particular production which we wish to bring to perfection in this country, to wit, fine wool, has never been yet ascertained. Some people imagine that hot climates are those in which we are to expect it in the greatest perfection, and yet we cannot but acknowledge the great beauty and excellence of the wool produced on the cold and rugged shores of the Shetland islands, as appears from the specimens before us *. Others imagine that the finest wool is to be expected from sheep which are perpetually kept wandering about in the open air, as is the case in Spain, and that confinement is ruinous: Whereas, on the other hand, it can be indisputably proved that the ancient Romans kept and fed their finest wooled sheep in houses, and even clothed them to make their wool more valuable. These, and other circumstances which might be mentioned, seem to render climate, though of some, yet undoubtedly of less essential, consequence. For my own part, I have no doubt, that if a good breed of sheep is procured, and if they are put under a proper system of management, that we may grow in Scotland as much fine wool as the extent of the country will admit. I shall therefore restrict the observations with which I am now to trouble you, to the two heads of breed and management.

I. *Breed.* I do not propose to enter into that speculative question, Whether all the various kinds of Sheep which are now scattered over the face of the globe have sprung from the same original, or whether different kinds have existed from the beginning? It is certain that great varieties now actually exist; and the first point undoubtedly is, to procure that particular breed, which either from

* Alluding to some beautiful specimens of Shetland wool presented to the Meeting.

natural causes, or by art and management, has been brought to the greatest perfection, or is the most likely to answer the object we may wish to obtain.

The first point of view in which the different breeds of sheep may be considered, is bulk or size. There are certainly advantages in a large-sized breed, where the pastures are rich. The carcase can soon be brought to market, and though the wool is coarse, and consequently low-priced, yet the enormous quantity, in some measure, makes up for the deficiency of quality. If, therefore, this country had no occasion for fine wool, either to clothe its own inhabitants, or to export, when manufactured, to other nations, the sooner that the large-sized, though coarse-wooled sheep, could be spread over the whole kingdom the better. But our situation is very different: we are obliged to import considerable quantities of clothing wool from another kingdom; and, from the progress of improvement in this island, the quantity of that valuable species of wool calculated for the manufacture of cloth is daily diminishing; we cannot, therefore, too soon endeavour to remedy what, in a manufacturing view, must be considered as an evil, before it takes too deep a root, and becomes more difficult to eradicate. Fortunately, also, the nature of the soil and pasture of the northern parts of England, of Wales, and of Scotland, by judicious management, seem to be well adapted to the production of that species of wool which is the most essential to us at present.

Wool may be considered under two great divisions, 1. *Combing*; and, 2. *Clothing* wool. A variety of sorts may be classed under each division; but under the one or the other, every kind of wool may be comprehended. The combing wool is distinguished by the length of its

staple, and is peculiarly well calculated for stockings, worsted stuffs, and the like. It is universally acknowledged that this kind of wool has been brought to the greatest perfection in England. It is, however, becoming of less value every day. Those worsted stuffs in which women of all ranks were formerly clothed, have given way to silk, to linen, and to cotton*. Some new uses have been discovered for this species of wool; but as it is already produced in such abundance, any great addition to the quantity might so much reduce its price as to render it less intitled to the attention of the farmer.

The other species of wool known under the name of short, the carding, or the *clothing* sort is of a very different nature. Its staple is not so long, but the pile is finer, and instead of terminating, like the combing sort, in a point, it is exactly of the same thickness from one end to the other. Hence the hairs easily incorporate together, and the cloth acquires that firm texture so desirable in this species of goods. The sheep which produce this sort of wool are small, delight in a wide range of pasture, and do not thrive in those narrow bounds with which the long-wooled, and large-sized sheep are content. They were formerly to be found in those extensive commons in England, of which so many have been inclosed by the authority of the legislature since the commencement of his present Majesty's reign; and as the spirit of inclosure is likely to increase rather than to

* The combing wool is sometimes cut to pieces, and used in the manufacture of cloth. Perhaps it would be better to cut the fleeces of the long-wooled sheep for that purpose twice or thrice a-year, and to keep them in houses in bad weather; the expence of which their manure, and the great quantity of wool they would produce, might repay. This at least would be worth the trial.

diminish, it is probable that some years hence there will scarcely be the vestige of an extensive common in the more southern parts of the island *. Unless therefore the clothing breed of sheep will thrive in the open and extensive pastures, which the northern parts of England, which Wales, and which Scotland furnish, Great Britain must every day become more and more dependent on foreign countries, for the raw material of its most important branch of manufacture. Now, therefore, is the time to try every necessary experiment for that purpose, not only for the peculiar advantage of those districts of the united kingdoms above alluded to, but for the general interests of the empire.

* A very intelligent and respectable gentleman has sent me the following account of the progress of this system in the western parts of England. It is only within these forty years that inclosing of commons began to prevail there; and before that took place, every farmer in the dry lands thought it his interest to attend to the fineness of the wool, whence his chief profit arose, and not to the size of the animal, the carcase being of so little value, that his fat sheep, even in the month of March, did not fetch above 3*d.* a-pound, instead of 4½*d.* its price at present. Soon after this period, the turnip and clover husbandry began to flourish; and the best farmers, encouraged by the better price for meat, began to think that their land might be turned to a more productive use, by introducing larger sized and more bony animals. The sheep of 8lb. per quarter, producing 1lb. of wool worth 1*s.* 3*d.* were, by procuring Dorsetshire rams, changed to 14lb. per quarter, and gave 3 lbs. of wool, worth 2*s.* 3*d.* The difference of value between the two animals amounted to about 9*s.* per head. Such large-sized animals could not thrive upon the short grass which uncultivated commons produced. It became an object, therefore, to inclose and improve the commons, by which system of husbandry, the produce of the lands has been so exceedingly increased, that what was formerly common or sheep walks is now generally let at 15*s.* per acre, and the ancient inclosure of 7*s.* value is now let at 20*s.* This accounts for the alteration in the quality of the wool, but the new system, in a national view, has produced the happiest consequences, by increasing the general wealth and produce of the country.

It is the more necessary to attend to this circumstance, especially in Scotland, because any improvement of wool that has been attempted here, has in general been by substituting the *combing* for the *clothing* sort, which, though well adapted for particular parts of the country, is far from being calculated for the whole kingdom. At this moment also sheep-farming is beginning to extend itself to the most distant corners of the kingdom; but on principles which seem to me to be of a very dangerous and noxious nature. The value of that part of the country, and the rents of the lands, have been greatly increased by these means. It is well known that, in the space of 25 years, the income of an estate in the Highlands has been raised from 400*l.* to about 1800*l.* a-year, without any other improvement than merely converting it from cattle into sheep farms. The wool which it produces is nevertheless sold at the rate of only 4½*d.* a pound. What a great addition would it not be to the value of that property, and of other estates in the same situation, were the wool which they produced rendered four or five times more valuable. By attention and good management, there is not the least doubt of obtaining this desirable object.

In fact, nothing can be more detrimental than the mode now used of converting cattle into sheep farms in the Highlands. The first thing that is done is to drive away all the present inhabitants. The next is to introduce a shepherd and a few dogs; and then to cover the mountains with flocks of wild, coarse-wooled, and savage animals, which seldom see their shepherd, or are benefited by his care. The true plan of rendering the Highlands valuable would be to follow a different system. As many as possible of the present inhabitants ought to be retained. They ought to be gradually

brought to exchange their cattle for a sufficient flock of valuable sheep. A flock of three hundred sheep might be maintained on the generality of Highland farms as they are at present constituted; and the profit of such a flock, with a few cattle, is sufficient to maintain a family in the manner in which the natives of the Highlands are accustomed to live. Thus the value of the country might be at least doubled, without diminishing the numbers of the people. Sheep-farming, when conducted upon proper principles, is not so great an enemy to population as is commonly imagined*.

Having premised these general observations, it may now be proper to consider what particular breeds of sheep seem to be the best entitled to the attention of this Society.

In the first place, it is certainly necessary that we should endeavour to bring the native sheep of the country to the greatest perfection of which they are susceptible. By attention, and by breeding from the best of each species, that point may easily be obtained. Scotland possesses within itself many excellent sorts, which can easily be multiplied. In Tiviotdale, in the parish of Mochrum, and in other parts of North Britain, the clothing wool, though still capable of much improvement, is at present of great value. The small white-faced native Scotch sheep, yields a species of wool that might answer many valuable purposes. With respect to combing wool, the Shetland sheep produces that article in almost unequalled perfection. I need not descant on this point, when I have the honour of laying before you so many specimens of its peculiar beauty and excellence. So valuable, indeed, is the Shetland wool, that

* In Naismith's Observations on the Industry of Scotland, this idea is very ably enforced.

our manufacturers could well afford to give from 7s. 6d. to 10s. 6d. per pound for the best sort of it, when properly prepared.

In the next place, it is necessary that we should propagate in this country those English breeds which are distinguished by the excellence of their fleeces, and which are likely to thrive in North Britain; confining our attention, however, principally to the carding breeds, without excluding, at the same time, combing wool, where it ought to be cultivated. Of these the most remarkable are, the breed of Herefordshire and of the South Downs in Suffex. Of the first, a fair experiment will be tried, in consequence of a very liberal offer from a gentleman in England to procure us a small flock of the very best that Herefordshire produces. They are rather of a tender and delicate nature, but may be familiarised to this country and climate, and have been already tried with success in the most northern county of Scotland. They ought to be housed, however, at night, when the weather is unfavourable. It is thought that the wool of the South Down breed resembles, more than any other in England, that of the Spanish. By the assistance of Lord Sheffield, whose public spirit on this occasion cannot be too much commended, we have already some of that breed in our possession.

But besides the breeds of England, it would be proper for this Society to try what would be the effect of introducing into this island the sheep of foreign countries, for the purpose of ascertaining the possibility of their thriving in this kingdom, or of meliorating our breed*. If Arabia is to be ransacked, for the improvement

* The foreign breed, from which I entertain the highest expectations, are those which are to be found in the neighbourhood of

ment of our race of horses, why may not similar means be used for improving our breed of sheep? Many animals, in different parts of the world, produce various kinds of fine wool or fur, which, in consequence of the extended commerce and navigation of Great Britain, might be procured with little difficulty. These animals would probably thrive here, and furnish materials of the utmost consequence to our most valuable manufactures.

To conclude this branch of the subject, I have no doubt, that, by pursuing a regular system of experiments, it will soon be in our power to ascertain what kinds of sheep are best calculated for the soil, the pasture, and the climate, of this country, and the most likely to prove profitable to individuals and useful to the state.

II. Management. It is unnecessary for me to trouble you with many observations respecting the proper management of sheep. One of the first steps which the Society will naturally take, will be, to offer premiums to persons who furnish it with the best information concerning sheep in general,—the different breeds of that useful animal,—the manner in which they ought to be managed,—the food best calculated for them,—the best mode of preventing or curing the distempers to which they are subject,—and, above all, the best means of meliorating their wool; together with any other fact

Mount Atlas in Africa, which there is reason to believe, are, in every respect greatly superior to the Spanish, and to a mixture with which the Spanish breed itself, in a great measure, owes its excellence. That gallant veteran, Sir Robert Boyd, previous to his departure, a few months ago, to take possession of the government of Gibraltar, was so obliging as to promise his best endeavour to procure some of that breed for the use of the Society.

or observation that may be judged material. By means of such works, drawn up in a plain and distinct manner, and published under the sanction of this Society, the necessary knowledge concerning this great branch of rural economy may soon be brought to perfection, and rapidly diffused over every part of the kingdom.

There are some points, however, to which I beg leave to call your peculiar attention.

In the proper management of sheep, the first thing to be considered is to procure the *food* best calculated for them. The nature of the food has a great influence upon the size and health of the animal, and consequently upon the wool. Where the pasture is rich, either from the natural fertility of the soil, or by the art and industry of man, and where the turnip husbandry or artificial grasses prevail to any great extent, coarse wool is the necessary consequence. Whereas, in the words of an elegant poet, who has celebrated the glory of the fleece,

On spacious airy downs, and gentle hills,
With grass and thyme o'erspread, and clover wild,
Where smiling Phœbus tempers every breeze,
The fairest flocks rejoice! Wide airy downs
Are health's gay walks to shepherd and to sheep*.

In regard to pasture calculated for sheep, there are few hilly districts in Scotland where it may not be found in great perfection and abundance, or may not be improved either by means of lime, or by a judicious system of watering. In Summer and Autumn no scarcity of food is to be apprehended. It must be ac-

* See Dyer's Fleece, book i. Virgil, in his Georgics, lib. iii. l. 384, also tells us,

“ Si tibi lanicium curæ, fuge pabula laeta.”

knowledged, at the same time, that during spring and winter, a considerable degree of foresight and exertion is requisite to provide a sufficient quantity of wholesome food for a numerous flock ; but the late improvements in husbandry furnish an active and intelligent farmer with ample means for that purpose.

Shelter from the inclemency of the seasons is, I am persuaded, an object entitled to the shepherd's peculiar attention, and without which fine wool cannot be expected in great abundance or perfection. The natural shelter of wood has been often recommended against too violent heat, and still more against cold and piercing winds. The severity of the weather, particularly when sheep are exposed to it both night and day, certainly affects the wool, makes it coarse, and fills it with hair. To obviate this inconvenience, the Herefordshire farmers have long ranges of buildings with low ceilings, each three or four stories high, with a slope at one end of each floor, reaching to the next, by which the sheep ascend the upper story. Having such houses built in hilly countries would be of great service in the improvement of wool ; and, when properly used, would prevent the rot, so ruinous to the shepherd *. The Romans, as has been already observed, kept their finest sheep in houses, and even clothed them. The manner in which they were treated is thus described by Columella. " Of all the wool-bearing kind, the Grecian
 " or Tarentinian is the most tender and delicate. They
 " can neither endure excessive heat nor cold. They
 " are seldom fed without doors, but for the most part
 " in the house, and are exceeding greedy of food. The

* See Marshall's Rural Economy of Gloucestershire, &c. Vol. II. p. 235, where there are many important observations on the utility of housing or coting sheep.

“ fields in which they are fed must be free of all
 “ manner of bushes, sprigs, or briars, lest both their
 “ wool and their covering be pulled off them, and even
 “ at home they must be frequently uncovered, refreshed,
 “ and cooled *.” Inquiries are making, on the part of
 this Society, whether there are still any remnants
 of this breed, or any vestige of this mode of treatment
 in Sicily or Calabria. It would be desirable to know
 what is the result of such a system of management, if it
 still exists in other countries. The effects of housing
 the sheep in Herefordshire ought also to be ascertained.
 If by clothing sheep †, or keeping them in houses,
 fine wool could be obtained sufficient for the consump-
 tion of these kingdoms, would it not be better to em-
 ploy the poor in the operations necessary for this pur-
 pose, than support them without exacting the least re-
 turn of labour for their maintenance?

The effects of salt upon sheep is a point which merits
 particular attention, and has never yet been fully in-
 vestigated. We know that it is given in considerable
 quantities to the flocks in Spain; and we see that fine
 wool is produced in the Shetland Islands, the pasture
 of which being peculiarly exposed to the sea spray, is
 necessarily impregnated with a considerable quantity of
 saline particles. It is certain that salt contributes much
 to the preservation of the health of granivorous ani-

* Columella, Book vi. chap. 5. from the English translation print-
 ed at London, anno 1745.

† To clothe the whole sheep would certainly be expensive: but I
 am told, that if the back were covered with a piece of coarse Osna-
 burg, the expence would not cost above 3*d.* a-piece, and if tarred
 it would last several years. In some parts of the country, tender or
 sickly lambs are thus treated, and it is found to answer well. The
 covering is fixed to the fleece, and cannot then be easily removed.

mals ; and it is well known that the finest wool can only be produced by sheep in a state of perfect health. Salt may possibly supply the stimulus necessary to preserve their health, and to enable them to digest the great quantity of coarse fare which they are often under the necessity of taking for want of better sustenance.

Other points might be mentioned connected with the proper management of sheep. I shall, however, at present only advert to the practice, very prevalent in this country, of *smearing* or *salving*, as it is called, the sheep with a mixture of oil or butter, and tar, which is supposed to be absolutely necessary for the safety and preservation of the animal in the greater part of the hilly and northern districts of this kingdom.

The origin of this practice is unknown *, and the effects of it are still doubtful. There is reason, however, to believe, that an alteration in the system of smearing may be attended with the most important consequences. It is now done about the commencement of winter, with a view of protecting the animal from the hardships of the approaching season, and of destroying the vermin with which it is infested. Smearing, however, ought rather to take place immediately after the sheep are shorn. This is an ancient practice, recommended by Columella. It was accidentally tried in this country some years ago, and proved in the highest degree successful. Anointing the sheep immediately after they are shorn, must be attended with much less difficulty, trouble, and expence. The vermin with which sheep are infested must be then destroyed in the

* Even in ancient times tar was considered as a remedy for diseased sheep ; but its use as a preventative is probably a modern practice.

state of nitts, and are not allowed three or four months to gain strength, which is the consequence of the present practice. It is affirmed by Celsus, that if a proper ointment is thus used, the wool becomes softer and longer; and that no sheep will be troubled, for that year, with the common diseases to which they are liable. To have this system fairly tried, is, I hope, one of the first objects to which this Society will direct its attention; and this may be done by giving premiums to the shepherds, who in different parts of the country are the most assiduous and successful in carrying it into effect*.

Such are some of the means by which the wool of these kingdoms might be greatly improved. And, since fine wool is of essential consequence to the manufactures of this country, why should we not endeavour to raise, within our own territories, what we require? Why should we suffer our supply of it to depend on the caprice of a foreign power, who might resolve to injure himself *much*, in order to injure us *more*; and who, therefore, might be tempted to prohibit the exportation of wool entirely, or to load with exorbitant duties an article, without which a number of our most industrious subjects would at once be deprived of their usual means of employment and sustenance?

* The medicament recommended by Columella and Celsus, is the juice of thoroughly boiled lupins, the dregs of old wine, and the dregs of oil, an equal quantity of each to be mixed together. The sheep to be thoroughly soaked with this liquor after it is shorn; and, three days afterwards, to be washed with sea water, or with boiled rain water mixed with salt. But it is believed that butter would answer fully as well as oil for encouraging the growth of the wool; and that a slight decoction of tobacco juice would destroy the vermin as well as any other liquor. If by these means a good fleece of wool was produced, there would be no occasion for any tar to shelter the animal from the inclemency of the season.

But, as the Society may wish to have some information respecting the value and amount of the fine wool imported into this country from Spain, I shall now proceed to give an authentic account of it for nineteen years, ending in 1789.

Spanish wool imported.			
	Pounds weight.		Pounds weight.
Anno 1771	1,829,772	Anno 1781	2,478,332
1772	1,536,685	1782	991,510
1773	1,477,284	1783	2,629,692
1774	2,133,496	1784	1,602,674
1775	2,031,973	1785	3,135,252
1776	2,062,628	1786	1,554,637
1777	2,853,065	1787	4,188,252
1778	489,869	1788	4,173,584
1779	519,664	1789	2,693,889
1780	323,618		
		Total	38,705,876

The average of the whole importation is 2,037,151 pounds weight each year, which, at 3s. per pound, amounts to £.305,572 : 13 : 0. But, if we take only the average of the last ten years, it is 2,377,144, which, at 3s. per pound, is equal to £.356,571 : 12 : 0. As Spanish wool is imported in the grease, it loses considerable weight in scouring, so that the wool, in fact, when adapted to the purposes of manufacture, costs us from about 4s. to 5s. a pound. The value of the labour necessary for manufacturing that quantity of wool is estimated, by Mr. Anstie, at £.400,000 sterling.

One important circumstance appears from the preceding account, that, though in time of peace, the importation of Spanish wool exceeds even four millions of pounds weight, yet, in time of war, it fell off to 3, 4, and 500,000. This tends to prove, what I am persuaded is the case, that the importation of Spanish wool

is not essential, and that, by proper attention and encouragement, we might supply our own looms with that important material. Nothing, however, can be more discouraging to the grower, than to have the exportation of his wool prohibited, while foreign wools are admitted duty free. Perhaps a small duty upon foreign wool, to be laid out in encouraging the growth of fine wool at home, would be the best plan that could be adopted for the general interests of the country,

It may be proper here to take notice of another circumstance. If the average importation for 19 years is 2,037,151 pounds weight, at the rate of three pounds to each fleece, it would require 679,050 sheep to produce it; and if one acre could maintain three of those sheep, it would require 226,516 acres to feed the number of fine-wooled sheep adequate to the demands of this country.

One other calculation I shall beg leave to trouble you with. It is supposed that about 100,000 head of cattle are sent every year from Scotland to England; to keep up which supply, there must be at least 300,000 head, young and old, fed in Scotland. The same quantity of pasture that supports them would maintain 1,200,000 sheep, which would produce above double the quantity of wool that England imports from Spain, without diminishing the quantity of meat raised for the sustenance of the people of this island, only converting it from beef to mutton. The cattle sent from Scotland may fetch about £.3 per head, or £.300,000 in all*; whereas the fleeces of 1,200,000 fine-wooled

* This was the price in 1791, but their value has since very considerably increased.

sheep and lambs would produce at least twice as much money, and we should have the carcase into the bargain.

I should be happy to be able to gratify the curiosity which this Society will naturally entertain respecting another point of still greater importance, to wit, What is the probable quantity of wool produced in Great Britain, the value of the raw material, and still more of the whole manufacture? But this cannot be given with accuracy. It is better, however, to have some information upon the subject, than to be left totally in the dark.

The wool of England, in the reign of Edward III. is generally supposed not to have exceeded in quantity 150,000 sacks, of 360 pound weight each, which is equal to 225,000 packs, of 240 pound, according to the packages of these days. In later times, computations have greatly varied. According to Davenant, there was in England alone, at the commencement of the present century, about 400,000 packs, worth £. 5 each; which, when manufactured, produced eight millions in value. Trowel, in his plan for preventing the clandestine running of wool, printed *anno* 1738, supposes 800,000 in England and Ireland, and about 925,000 packs in the three kingdoms*. Others, about the same time, computed the number of packs at 1,274,000. Mr. Arthur Young calculates the number of sheep in England alone at nearly 29,000,000, and the value of the whole growth and labour of the wool of Great Britain and Ireland at £. 17,695,529;

* A respectable member of this Association, (Mr. Wansey of Salisbury,) informs me, that, in 1740, an estimate of the growth of wool, in England, was given in to the Lords of the Treasury, when it was stated at 738,000 packs. This is probably the same with Trowel's.

furnishing employment to about a million and a half of people. We shall suppose, however, that there are only 28,800,000 sheep in the whole Island of Great Britain, producing, at an average, 5lb. weight of wool each, or 144,000,000 pounds in all, equal to 600,000 packs, and worth at the rate of £.8 per pack, £.4,800,000. If the value of the raw material is quadrupled by the labour that is bestowed upon it, the growth and labour will amount to £.19,200,000; to which, if there is added the value of the wool imported from Spain, and the labour employed in it, *it will make a total of about Twenty Millions.*

Is it then to be wondered at, that this manufacture should be considered as, in a special manner, entitled to the public attention? But, great as it is, I have no hesitation in saying, that I wish to see it still greater in itself, and more useful to the country. I shall, therefore, now proceed to trouble you with some observations, tending to point out the advantages which the public at large, and the woollen manufacture in particular, may expect to derive from an Association, whose object is to bring the natural staple of these kingdoms to the greatest perfection of which it is susceptible.

There are certainly no means by which the situation and circumstances of any country can be so easily and so rapidly improved, as by the union of a number of persons for the attainment of particular objects. Single individuals are seldom capable of carrying such plans into effect. There are few who can afford the expence which such projects require, and there are still fewer who have knowledge, judgment, perseverance, and health sufficient to bring them to perfection. Whereas a body of men, united for any particular object, can raise such sums of money as may be necessary for the purpose,

purpose, without any injury to their private fortunes; they can mutually assist each other in procuring all the lights and information that is requisite for attaining the object in view; they can prosecute the scheme, without encroaching on the time which ought to be dedicated to their own personal concerns; they can persevere in any system which it is proper to pursue, much longer than would be in the power of any individual; they can procure the assistance of other respectable bodies of men to aid them in their undertaking; and can apply, if necessary, with a rational prospect of success, for the support of the public, and the protection of their sovereign. These are advantages which associations possess, for the acquisition of various objects of great public importance; but, above all, they are well calculated for bringing to perfection a production natural to this country, and for which in former times it was deservedly famous. From various circumstances already hinted at, this production has unfortunately degenerated. To clear up the doubts respecting that degeneracy, which some intelligent and patriotic individuals may entertain, and to trace the nature and causes of it, would of itself be an important object of inquiry.

Many peculiar advantages may also be derived from this institution. Through the medium of the friends and connections of the members, who would naturally become interested in the success of the measure, by publishing their proceedings, a general knowledge on the subject of wool, and a spirit of enterprise and exertion, would be circulated over the whole kingdom. By means of the useful books published by the Society, the mode of managing sheep to the utmost advantage, and the best practices, both foreign and domestic, would soon

soon become generally known. Under the patronage of such a Society, skilful individuals might be established in different parts of the kingdom, where the practice of stapling is unknown, by whose directions, the wool we have might be greatly improved in value, merely by sorting the fleece according to the various qualities of which it is possessed. There are many intelligent and enterprising farmers, who, were they appointed corresponding members of such a Society, might easily be prevailed on to try many useful experiments, and to make the result of them public; by means of which it might be proved, that fineness of wool was by no means incompatible with the other excellencies by which particular breeds of sheep are distinguished. The premiums distributed by the Society, must have the happy effect of rousing a spirit of emulation and rivalry among those who may be benefited by them. Nor ought it to be omitted, that when such a Society has succeeded in one point, they may gradually extend their views to others of perhaps equal public importance; and that, when once the benefits of industry and exertion are clearly exemplified by the success of any number of individuals in a particular line, it is a circumstance which has a very important influence on the views and on the conduct of the rest of the community.

On the whole, this is an enterprise which cannot in any respect be prejudicial; which can have no object in view but public good, and no possible consequence but public benefit; and which, if it is properly supported by patriotic individuals, and by respectable bodies of men, must prove the source of successful industry, and of infinite wealth to ourselves and to our posterity.

ADDITIONAL OBSERVATIONS,

In consequence of the preceding Address, a Society was constituted, an account of whose progress will be found in an Appendix to the Agricultural Survey of Mid Lothian. After some years of perseverance in their pursuit, the Society was dissolved, but not until it had accomplished the principal objects for which it was originally established; leaving such experiments as it had not leisure to finish, in the hands of persons likely to complete them. The following are the objects which it actually did accomplish.

1. It roused a great spirit for the improvement of sheep and wool, and introduced those *Sheep Shearing Festivals* which are likely to be productive of so much public benefit.

2. It improved so much, by premiums, the quality of the Shetland wool, and increased so much its price, as to add £.3000 *per ann.* to the value of those remote Islands.

3. After many enquiries, and much correspondence, and several surveys made, some by intelligent farmers, at the expence of the Society, and others by members of the Society, at their own expence, it was at last ascertained, that a breed of sheep were to be found on the borders of England and Scotland, to which the Society gave the name of *The Cheviot Breed*, which was peculiarly calculated for a hilly or mountainous district, possessing great hardiness of constitution, and a very valuable fleece.

This breed is now extending itself over the most northern parts of the Island, and will render those remote districts infinitely more valuable to the proprietors

tors and occupiers, and much more useful to the public, than otherwise they could have been.

Lastly, under the auspices of the British Wool Society, the Cheviot breed of sheep itself has been greatly improved; a subordinate Society having been erected for that purpose, by several public spirited farmers on the borders, by whose exertions that species of sheep, it is to be hoped, will not only be materially improved, but will soon be ranked amongst the most celebrated breeds in the Island, more especially for possessing all those requisites by which a mountain breed ought to be distinguished.

APPENDIX.

No. I.

Observations on the proper System to be pursued for the Improvement of British Wool.*

SIR JOHN SINCLAIR has much pleasure in communicating to the public a paper, containing the observations of three experienced and intelligent storemasters, or sheep-farmers, respecting the different breeds of sheep, which are to be found in the southern part of the Island; and he thinks it a matter of the utmost consequence to the interests of both kingdoms that the facts therein contained should be made known as generally as possible, since, from every circumstance which these gentlemen have reported, it seems to be indisputably ascertained, that the improvement of sheep and wool is an object, *if possible*, of more consequence to England, than even to Scotland; and, in particular, that the spreading the Cheviot breed of sheep, and the Cheviot system of management, over the mountainous districts of South, as well as of North Britain, are points well entitled to the greatest exertions on the part of individuals, and to every possible encouragement on the part of the public.

The attention of the country, however, ought not to be confined to any one particular species, nor will any person, who has ever had an opportunity of considering the subject in the manner which its importance deserves, ever entertain the idea, that only one breed of sheep ought to be propagated in these kingdoms. For, whether we take into our consideration

* These Observations were prefixed to the Tour made by Messrs. Redhead, Laing, and Marshall, for ascertaining the state of sheep-farming in England; printed an. 1792.

the hardy and plastic nature of the animal itself, the variety of ground on which it may be safely pastured, the different sorts of wool which they may be made to produce, or the great variety of purposes to which that wool is applicable, it is evident that nature intended that there should be a considerable diversity of breeds, even in the same country. It would appear, at the same time, that in these kingdoms, we may safely restrict ourselves to five sorts, which may be distinguished by the names of the Marsh land,—the Arable land,—the Hill,—the Mountain,—and the Shetland breeds; since one or other of them may be maintained, on every sort of ground or pasture we are possessed of, and will produce every description of wool that can possibly be required in all our various manufactures.

I. *Marsh Land Sheep.*—In the rich pastures, or marsh lands of England, a particular species of sheep has been brought to very great perfection. It is certain, that the very richness of the pasture itself, more especially if aided by proper management on the part of the shepherd, would soon rear a breed, distinguished by the size of the animal, and the length and quantity of its wool. In a fertile country, indeed, it can hardly be doubted, that QUANTITY of wool, and QUANTITY of mutton, or a large fleece, and a large carcase, are the proper objects of attention; whereas in a hilly or mountainous district, QUALITY of wool and QUALITY of mutton, are the principal points to be attended to. The Tees Water and Lincolnshire breeds, before they were crossed by smaller and shorter wooled sheep, undoubtedly approached the nearest to perfection of the large sort. In point of size and weight, they surpassed every other breed, and their wool was so long, as, in some cases, to have reached the length of even 24 inches. These breeds, it is true, were not remarkable for fattening quickly, nor at an early age; but from the length of their limbs, and the size of their carcase, they were particularly valuable, as they could be driven over the deepest roads, and might be sent to the London, or any other distant market, at as cheap a rate as an animal of half their size, weight, or value. There are many manufactures also, that cannot be

carried on to the same advantage, without having the wool produced by that breed, or of a similar nature and quality. It is therefore of the utmost consequence to preserve them from being extirpated, and to bring them to perfection; both of which may be effected, by a moderate share of public attention and encouragement.

II. *Arable Land Sheep.*—The connecting sheep farming with husbandry, as it is now established in many parts of England, and on the borders of Scotland, is a very important source indeed of national wealth. It is by far the best means of preserving the fields of a country, in a perpetual state of fertility and cultivation. For enriching land, the dung of sheep is well known to be the most fertilizing of manures. The cultivation of clover and rye-grass, joined to the turnip husbandry, is unquestionably the surest mode of cleaning the ground from those noxious weeds by which its strength is exhausted; and if the turnips are devoured by sheep on the fields, such luxuriant crops of grain may afterwards be raised as could not be produced by any other means on the same ground. The discovery, therefore, of the best breed for arable land, and spreading them in every district, calculated for the purpose, is a most important object, the extension of which cannot be too frequently inculcated. The quantity of wool, it is true, produced by this species of sheep, is not equal to the marsh land, either in point of weight or quality; yet it is considerable in itself, and answers many valuable purposes. But the great advantages which this breed possesses are these: 1. The great weight of the animal, which is more considerable than its appearance would denote, in consequence of the excellence of its form. 2. The early age at which it comes to perfection, being fit for the butcher even at two years old; consequently as much profit is derived by the farmer from his carcase at that age, as from other breeds at 4 or 5 years old; besides, the breeder, in this case, generally also enjoys the profits of the grazier. Lastly, The great quantity of fat which this breed produces, is a matter of considerable moment. This sort of sheep, it may be truly said, has been already brought to perfection by Mr. Bakewell of Dishley, Mr. Paget and Mr. Princeps
of

of Leicestershire, the Messrs. Cülleys of Northumberland, and other eminent breeders. It is certainly desirable to have this valuable breed propagated in all the districts for which they are calculated. But there are obstacles in making them as general as they ought to be, in consequence of the high prices demanded by those who are in the possession of the best sort, and the difficulty of obtaining from them the ewe as well as the ram. These obstacles, however, must, by some means or other, be surmounted, either by some arrangement with the breeders who have carried that sort of sheep to the greatest perfection, or by encouraging others to rival them, who may be more liberal and communicative. It will be difficult, at the same time, if these obstacles were overcome, to keep this breed within their proper sphere, namely, arable districts; and yet nothing can be more absurd or preposterous than to suppose, that a fat animal, incumbered with a great quantity of wool, can ever be calculated for a hilly, and far less for a mountainous district; or, that a boundless and profitable market can be expected both for the wool and the carcase of any particular species.

III. *Hill or Down Sheep*.—It is well known that wool may be divided into two sorts, the one fit for combing, and adapted for stuffs, stockings, &c. the other for carding, from which, according to the nature of the material, either coarse or fine cloth may be manufactured. Of the carding woolled sheep, those which are fed on downs or hills, covered with short grass, furnish the wool best calculated for making broad cloth. England formerly produced a considerable quantity of that sort, but from the extension of cultivation and improvement, it is diminishing every day, and unless the hilly districts of Scotland are appropriated to that purpose, we must soon become almost entirely dependent on our neighbours for a most important article of manufacture. Fortunately, however, in consequence of the late inquiries which have been made, respecting the improvement of wool, it has been ascertained, that the Spanish breed of sheep will thrive as well in this country as on their native hills; and that their wool, so far as the experiment has yet been tried, instead of degenerating,

rating, rather improves, both in regard to colour and softness, without growing coarser in the pile. But, as the shape of the Spanish sheep is greatly inferior to the English, it is a fortunate circumstance to have it also ascertained, that there are sheep in England, producing, on a fair comparison, as fine a pile of wool as even the Spanish. The fleeces of the best Ryeland and Morfe sheep are unquestionably entitled to that character. The manufacturers, however, have always found, that the wool of these breeds, though to appearance as fine in the quality, yet could never be made into cloth of equal value, and, consequently, was not entitled to the same price *. But the cause of that essential difference is now discovered. The Spanish breed of sheep, it is well known, are kept on good pasture all the year round; and it is for the sake of procuring them food, and not with any idea, as is absurdly imagined, of keeping them always in the same temperature, that they are driven from one part of the kingdom to the other; whereas the fine wooled English breeds are either kept on commons, which are constantly overstocked, or on fallows, where they have scarcely any food to support them. The consequence is, that the fleece is light, wants strength and substance, and cannot properly be worked into strong and substantial cloth. It is believed also, that some improvements might be made in scouring fine English wools, which would make them spin more easily, and full or mill much better than at present †.

* Mr. Coles, an eminent manufacturer in Trowbridge, who scarcely ever before did any business but in Spanish wool, has agreed, in the course of this year, to give the Morfe wool a fair trial. Perhaps, if it were manufactured in the French style, looser, and less milled, it might answer better, considering the weakness of the staple at present, a defect which, it is to be hoped, will be remedied.

† The manufacturers complain of a kind of *gumminess* about English wool, which prevents its spinning and milling well. Perhaps this is owing to obstructed perspiration, in consequence of the humidity and variableness of our climate. But to whatever cause it may be owing, the same process by which the furrier cleans his skins, would free our English wools from any impurity of that nature, and in that case it would spin and mill as well as the Spanish.

It is therefore of the most essential consequence to the kingdom at large, to have these breeds, (in particular the Ryeland,) saved from that destruction with which they are threatened; and some plan of management recommended to the attention of those who have the pure breed still in their possession, that would bring their fleeces to perfection. Giving them better food, and salt to enable them to digest it, seems to be all that is necessary; and when the wool of Hereford and of Shropshire begins to fetch as high a price as the Spanish, (or from 4s. to 5s. a-pound), the propagation of these breeds must become general; as it will soon appear that it tends as much to the interest of the farmer as that of the public.

Among the hill sheep, the Southdown breed is also entitled to peculiar attention; its hardiness is almost proverbial*; indeed, otherwise it could not exist in the exposed situations where they are kept at present; and there are many parts of the island where they would probably answer, perhaps better than even the Hereford, though their wool is not yet so valuable. In regard to this part of the subject, it may be added, that, in so far as can be judged from any experiment yet tried, it is believed that the Southdown, the Hereford, and even the Spanish would thrive in mountainous as well as hilly districts, where they were bred upon the spot, and properly attended to by the shepherd; but in the wide ranges of a mountainous country, great care and attention cannot be expected; and hence arises the necessity of making a distinction between the breed to be propagated in the hilly and in the mountainous parts of this kingdom.

IV. *Mountain Sheep*.—It need hardly be stated, that sheep is by far the most profitable stock for a mountainous country. It is the only animal, the goat excepted, that can feed there with advantage to its owner, and though in some countries, where they breed that species of goat that carries fine wool

* Sheep, it is said, would be brought to perfection, were it possible to unite, in the same animal, the fleece of the Spanish, the carcase of the Bakewell, and the constitution of the Southdown breed.

under its coarse hair, like the shawl goat, they may perhaps be led to prefer the goat to the sheep, yet with us, in all situations, unless where there are nothing but rocks, covered with wood, the rearing of sheep is found to be infinitely more profitable. Of the different breeds which are kept on the mountainous districts of this Island, the *Cheviot* seems to be the best calculated of any perhaps hitherto known, for such a pasture; uniting hardiness, quality of wool, and excellence of shape and mutton, and possessing that length of limb and body which enables them to travel without difficulty, either in quest of food, or to a distant market. In general, however, in the mountainous districts both of England and Scotland, they have got into a species of sheep with coarse, thin, loose, and open fleeces; so that the least breeze exposes the skin to the blast, and the slightest shower of rain penetrates to it. No species of sheep can be more incompatible with a high situation; for a true mountain sheep ought to have a *short* fleece, that it may be more portable, a *thick* fleece, to prevent either snow or rain from penetrating it, and a *fine* woolled fleece, to keep the animal warm; fine wool being infinitely warmer than coarse, as a shawl is proportionably so much warmer than a blanket. The great object in regard to the Cheviot breed, is, to diminish the quantity of coarse, and to increase the quantity of fine wool in the fleece as much as possible*. As to the prejudice, that fine woolled sheep will not thrive in the high and mountainous districts of Great Britain, but must necessa-

* The coarseness of so considerable a part of the fleece is the principal defect of the Cheviot breed. That, however, may be remedied, by crossing with the Hereford, or Southdown; for though crossing in general is not to be approved of, (because it makes an unequal, or unfortable stock for the grazer, and a variety of sorts of wool, to which the manufacturer so justly objects,) yet where the breeds resemble each other much, which is the case with the Cheviot, and the Hereford, and the Southdown, then, by a judicious system of crossing, and a little attention and perseverance, any single point to be wished for, in regard either to the shape or the fleece, may be obtained.

rily degenerate, it might as well be said, that, because these kingdoms were, in ancient times, inhabited by a race of ignorant and naked savages, who painted their bodies, and had not knowledge enough to clothe themselves against the inclemency of the seasons, it was therefore impossible that the same countries could ever produce men conspicuous for their intelligence and capacity, and for their skill in every art by which civilised life is so happily distinguished*.

V. *Shetland Sheep*.—The best species of the Shetland breed may undoubtedly be considered as a distinct sort, which ought to be carefully preserved, and brought to its greatest possible perfection. Its wool is a medium between the combing and the carding wools; and being applicable to finer purposes than either, namely, the most beautiful stockings, shawls, gown, and waistcoat pieces, it is much more valuable than any other species. Its principal defect is, that many of the sheep have a number of black hairs mixed with the white. But there are many of that sort of sheep, whose wool is of the purest and most dazzling white, surpassing any thing of the kind that can be produced from any other country. The skin of this breed, also, can be converted into a species of fur, not to be surpassed by any other, either for warmth or beauty.

Such are the different breeds of sheep †, which, after a considerable degree of attention to the subject, I would particularly

* It is said, that, as the goat is covered with coarse hair, it necessarily follows, that mountain sheep should resemble them in that particular, and that it is a sign of strength and hardiness. But the hardiness of the goat does not depend upon its fleece, (which, by the bye, has, in many countries, a soft down under the coarse hair, as is the case in particular with the shawl goat,) but principally arises from the great thickness of its skin, in which respect it greatly exceeds the sheep. The justly celebrated Dr. Monro, having agreed to take the trouble of anatomising all the different breeds of sheep, collected by the British Wool Society, how far they differ from each other, in regard to thickness of pelt or skin, as well as in every other respect, will soon be accurately ascertained.

† The length of the wool of these different breeds, ought certainly

larly recommend to the people of this country, and which, if they were brought to perfection, and spread over every district, according as they are best calculated for it, Great Britain would soon become infinitely richer, than it is even at present. This being a matter which is to be brought under the consideration of Parliament, early in the course of the present session, I thought it advisable to take the first opportunity to throw out some general ideas upon the subject. It is evident that, by establishing a proper system of sheep farming, and connecting it with husbandry, agriculture may be brought to an incredible height of perfection; and it will hardly be disputed, that the fleeces of the country furnish the materials of our greatest and most valuable manufacture*. The British
Wool

tainly to vary. Perhaps the average length of each, at its full growth, ought to be as follows:

1. Marshland sheep,	-	-	-	16 Inches,
2. Arable land sheep,	-	-	-	8
3. Mountain sheep,	-	-	-	4
4. Hill sheep,	-	-	-	2

—In regard to the Shetland, (which is properly a medium sort of wool,) from 5 to 7 inches is the length that would be most desirable.

* There is one point of view, in which the subject has never been considered; namely, that by covering our hills and mountains with fine wooled sheep, they may be made nearly as valuable to the community as even arable land. It may be put hypothetically thus: Let us suppose that the produce of arable land, is, at an average, five guineas *per* acre. Let us suppose, on the other hand, that hill grounds may be improved, so as to keep two sheep *per* acre; that every sheep produces $3\frac{1}{2}$ lb. of fine wool; and that every pound may be brought to be worth 3s. in the fleece; and lastly, that the value of fine wool is quadrupled by the art of the manufacturer. Each acre, therefore, would produce 7 lb. of wool, which would sell for a guinea, and would be manufactured into articles worth 4 guineas; and if the sheep produce lambs worth half a guinea a piece, the community would then receive 5 guineas *per annum*, from each acre of hill pasture, as well as from each acre of arable ground, and it would be of little consequence to the country, whether the produce is in wheat or wool, provided the one could be converted into

Wool Society, by calling the attention of the public to the improvement of this important article, have certainly done much service to their country. Under their patronage, the greater part of the Island has been surveyed by persons skilled in the management of sheep, whose observations they are circulating over the kingdom. They have established many important facts; they have proved, that the finest breeds of Spain, or of England, will thrive in the wildest of the Cheviot hills, and that very fine wooled breeds may be propagated, in the most mountainous districts of Scotland.—BUT UNLESS THIS OBJECT IS THOUGHT WORTHY OF PUBLIC ATTENTION AND ENCOURAGEMENT,—UNLESS A BOARD OF AGRICULTURE IS CONSTITUTED FOR THE SOLE PURPOSE OF SUPERINTENDING THE IMPROVEMENT OF THE SHEEP AND WOOL OF THE COUNTRY, AND OTHER OBJECTS CONNECTED EITHER WITH THE CULTIVATION OR THE PASTURAGE OF THE SOIL *, the exertions of any private society must soon slacken, and its labours become useless and insufficient; whereas, under the protection of the Government of the country, and the superintendance of a Board of Agriculture properly constituted, (more especially if formed of persons who *gratuitously* devoted their services to promote such valuable and truly national interests,) every field would soon be cultivated to the best advantage, and every species of stock brought to the greatest possible perfection †.

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as much value as the other.—This calculation, it must be acknowledged, is merely hypothetical, and rather favourable to the articles produced by pasture, but at the same time it shews the immense advantages that may be derived by improving our waste lands, and covering them with fine wooled breeds of sheep.

* This is the first hint given by the Author, of his intention to propose the establishment of a Board of Agriculture.

† A material point for quickly propagating the different breeds, which were thought best entitled to attention, would be to appoint *public agents* at the places where they are found in the greatest perfection, for the purpose of encouraging the farmers in the neighbourhood to attend more to the improvement of their stock, and of corresponding

Here also it may be proper to take notice of an opinion which some have entertained, that the improvement of the different breeds of sheep in the country must necessarily be attended with so much profit to their respective owners, that it is idle for the public to put itself to any trouble or expence about a matter which may be left entirely to the exertions of the farmer himself, who will not neglect what must tend so essentially to promote his own personal interest:

responding with all those who might be desirous of purchasing such breeds; and in order also, to contrive the means of sending them at as little expence, and with as little difficulty as possible, to the places for which they are destined.—It was only by means of following such a plan that the knowledge of the Cheviot breed has been so rapidly extended all over Scotland.—If every person who wishes to try a particular breed is obliged to go to the spot himself, or to send persons to bring a small parcel with them, to a considerable distance, the expence and trouble is so great, that few will think of attempting it; but if a person of skill and character is appointed to act as a common agent in the business, between the buyer and seller, it will be in his power to accommodate every one with the stock they want; and by sending large flocks, under the management of skilful drivers, to every quarter where they are wished for, leaving each parcel at the place nearest to the spot where the purchaser resides; it is incredible by means of such an arrangement, with what ease and at what a trifling expence, any particular breed might be spread over a country.—A flock of 50 rams and 100 ewes were sent by the British Wool Society, from the borders of England and Scotland to Caithness, (a journey of 350 miles,) without the loss of a single sheep. They were divided into small parcels, consisting of a ram and two ewes, among from 40 to 50 different people, who were disposed to try them in every possible situation. The flock kept one route, and every individual got his share left for him, at, or as near as could be contrived to, his place of residence. Had each of these persons gone separately to the Cheviot hills, and sent his parcel north by a separate driver, the charges would have been enormous. Whereas by following the above plan, the whole expence of driving them 350 miles, including tolls, ferries, maintenance, shepherd, &c. only came to 1s. 1½d. per head.

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Such an idea, however, is perfectly erroneous. Had it been well founded, the sheep, in these kingdoms, would have arrived at perfection ages ago. It is certain that the farmer, by meliorating his wool, will get a better price for it, (though proportionally not so much as he would do, were the commerce of that article perfectly free and unrestrained,) but his profit is trifling in comparison of the great advantages which the public must derive from having so valuable a material of manufacture as fine wool, in perfection and abundance; whilst, at the same time, it is proposed that the farmer should be at the sole expence and risk of the improvement*.

It is impossible also, for any one, who has not had some experience in such an undertaking, to have any conception of the difficulties attending so great an operation as that of bringing about a revolution in the system of sheep farming, were it confined even to the mountainous districts of a great country. It

* Changing an entire flock is attended with more trouble, expence, and risk to the farmer, than can well be imagined; particularly if there is a great demand for the breed that is to be purchased. The breed to be parted with always sells to great disadvantage. The new breed is not only bought dear, but does not always agree with a change of pasture, which occasions a considerable loss. If the system of crossing were adopted, many years might elapse before any thing material was done: and the farmer would tire of experiments from which he derived only a trifling or gradual profit. In short, if it is a great and important object for the public, to have wool in perfection and abundance, it ought to be at the expence of bringing every valuable breed the country is possessed of to perfection; of spreading them over the country, in their utmost purity, as quickly as possible, and of extirpating every inferior sort. Nor would the expence be great. A penny *per* pound on foreign wool imported, (a trifling duty, which several respectable manufacturers have assured me they would not object to,) would produce from £.8000 to £.10,000 a-year, and would be sufficient for the purpose. The produce of a tax on pigeon-houses, so noxious to the farmer, might be laid out in promoting the general interests of agriculture; or a tax, either on dogs or on weights and measures, might be imposed, for objects of that nature, as a useful regulation of police, as well as a source of income.

is necessary for that purpose to satisfy—the *breeder*, that a change of breed will suit his pasture, and will be more profitable than the one he is accustomed to—the *grazier*, that he will derive more advantage by purchasing that sort of sheep, for the purpose of fattening it*—the *butcher*, that the carcase will be as much in request with the customers he serves—the *consumer*, that the mutton is not inferior in point of taste and flavour—the *currier*, that the *pelt* or skin will answer his purpose better—the *wool-stapler*, that more profit may be expected from sorting the fleeces they produce—and the *manufacturer*, that the wool of the breed recommended can be worked up into better cloth, for which there must always be a greater demand, and a better price at the market.—To overcome the prejudices of all these different descriptions of people, and to give them new light and fresh information upon topics which they are apt to believe, they must understand better than any other person, is an operose and troublesome business, which, however important (and none can equal it in point of value) can never be effected without an expence, to which the public alone is equal; and without a degree of publicity and perseverance, which can only be expected from a great national establishment, constituted for that special purpose.

No. II.

Description of the Cheviot Breed of Sheep †, with an Analysis of a Cheviot Sheep Farm.

PERHAPS there is no part of the whole Island where, at first sight, a fine woolled breed of sheep, is less to be expected than

* The Yorkshire graziers may be assured, that their prejudices in favour of the black-faced, and against the Cheviot breed, are perfectly groundless, the latter being as hardy, and more profitable than the former.

† This breed was formerly known under the name of the *long sheep*, from the length of their make, in contradistinction to the
common

than among the Cheviot hills. Many parts of the sheep-walks there consist of nothing but peat bogs and deep morasses.—During the winter, the hills are covered with snow for two, three, and sometimes even four months, and they have an ample proportion of bad weather during the other seasons of the year; yet there a species of sheep are to be found, taking all their properties together, equal, if not superior, to any other in Great Britain, *for a mountainous district*, and which will thrive even in the wildest parts of it.

These sheep are well shaped, and among the best bred flocks the fore-quarter is distinguished by such justness of proportion, as to be equal in weight to the hind. Their limbs are of a length to fit them for travelling; and to enable them to pass over bogs and snows, through which a shorter-legged animal could not well penetrate;—they are polled, white-faced, and have rarely any black spots on any part of their body;—they have a closer fleece than the Tweeddale, or Linton breed, which keeps them warmer in cold weather, and prevents either rain or snow from incommoding them;—their fleece is shorter, and, of consequence, it is evidently more portable over mountainous pastures;—they are excellent snow breakers, and are accustomed to procure their food by scraping the snow off the ground with their feet, even when the top is hardened by frost;—they have never any other food, (unless when it is proposed to fatten them) besides the grass and natural hay produced on their own hills. They are, it is said, less subject to diseases than the common black-faced kind, particularly to what is called the *braxy* or the *sickness*. They sell at a good

common black-faced breed, which were called the *short* sheep; their shape being much shorter; but, as the former were found in the greatest perfection in the neighbourhood of the *Cheviot hills*, it was thought advisable to give them a name from a district so memorable, both in the history, and in the legends of the country; and hence the name has been given them of the *Cheviot breed*. Those who wish to give this breed a fair trial should purchase from the stocks of the store farmers in the neighbourhood of Jedburgh, and other parts on the borders.

price to the grazier, and their value for feeding is rising every day; the draft or cast ewes when lean, now fetching from 12s. to 20s. a piece, and three year old widders from 18s. to 30s. Their weight when fat, at four years old, is from 15 to 20 lib. per quarter; and the mutton, when fed upon heath, and kept to a proper age, is fully equal in taste or flavour to any that the Highlands produce. Lambs fed for the butcher, on the milk of the ewe, now fetch from 8s. to 10s. and upwards a piece. From eight to nine fleeces of white wool make a stone of 24 lib. weight, and from 6 to 8 fleeces when the wool is laid or smeared. The laid or smeared wool sold, in 1792, at from 18s. to 20s. and the white from 20s. to 22s. Some went as high as 23s. and from the improvements now going forward, it will soon fetch 30s. if not 40s. per stone. Their superiority over the Tweeddale or common black-faced breed, is incontrovertibly proved by a variety of experiments. Mr. Thomas Scott, at Letham on Carter Fell, a mountain about 1600 feet above the level of the sea, exchanged, in 1773, with Walter Hog, in Etterick forest, five white-faced for as many black-faced tups, but had every reason to regret the experiment, which was far from being the case with Mr. Hog. Mr. Roger Marshall, at Blindburn, in Northumberland, came to that farm in 1769, and purchased the stock upon the ground, among which there were many black-faced sheep. These he completely extirpated, and found it greatly to his advantage. So much convinced, indeed, are the farmers in the neighbourhood, particularly those of Etterick forest, of Ewesdale, and Liddefdale, of their superior excellence, that they are now converting their flocks, as quickly as possible, into the Cheviot breed.

The progress that has been made in improving this breed, particularly in regard to meliorating its wool, is in the highest degree satisfactory. About twenty years ago, the average of the white and laid wool was about ten fleeces to the stone, which sold for about 8s. whereas now the value is not only more than trebled, but the weight is so much increased, that, at an average, eight fleeces will make a stone. Even this excellent breed, however, is still capable of some improvement,

and the experiments which are now going forward, will soon ascertain by what means that improvement can best be procured. The shape of the animal, for a hilly district, is almost brought to perfection; but the wool requires, 1st, to be still finer in the pile; 2dly, shorter in the staple, so as to make it not only more portable for the animal itself, but fitter for being manufactured into cloth; 3dly, thicker in the coat, so as to keep the animal warmer; and, lastly, more equal in point of quality, (*a circumstance of very great importance*) so that the whole fleece may be as nearly as possible the same. These are qualities which the Spanish, the Hereford, and the South-down breeds possess in very great perfection; and if once the hardiness, the excellent carcase, and the other advantages of the Cheviot breed were united to these properties, *mountain sheep would be brought to their greatest height of perfection*. All these different crosses are now under trial; and, as yet, every one of them seems to have succeeded, so that any of them may be followed with success. In regard to the original Cheviot breed, they have been tried, on a greater or lesser scale, in every part of Scotland; and, on every occasion, they have answered in the wildest part of the country, and even in places where no sheep were ever kept before, at least in any quantity.

The store farmers in the neighbourhood of the Cheviot hills having brought the proper management of the mountain breed to very great perfection, it was imagined that a general idea of the system they pursue would be acceptable, particularly to those who may be desirous of engaging in the profitable occupation of a shepherd; with that view, the following analysis of a Cheviot farm was drawn up; which will explain also, some of the general principles on which a store farm ought to be conducted.

A sheep farm may be of any size, according to the stock or capital of the farmer, but in general a *complete farm*, or one which possesses within itself the different sorts of pasture calculated for sheep of every different age and quality) ought to contain about 2000 sheep, which may be divided in the following proportions:

1. Thirty score ewes,	600
2. Eighteen score and ten of three-year-old widders,	370
3. Eight score of young ewes, of two years old, called <i>gimmers</i> , for supplying the place of older ewes, when they are drawn to be sold off,	160
4. Eighteen score and ten of young widders, or diamonds,	370
5. Twenty-five score of lambs,	500
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Total stock,	2000
	<hr/>

Besides the above, a complete farm ought to keep about ten rams, or at the rate of sixty ewes to a ram, and also the number of sheep, the pasture of which is usually allowed to the shepherds. The stock is commonly divided into four distinct flocks, or *birfels*, as they are called. 1. The breeding ewes. 2. The widders and young ewes. 3. The *gimmers* and diamonds; and 4. The lambs;—each under a separate shepherd, who, if he has had sufficient experience, may, at least, take 500 sheep under his care. The shepherds have their board, but no wages or profit, except from the sheep they are allowed to pasture, which varies, according to their skill and character, from 45 to 60 sheep each; consequently there must be additional pasture for about 200 sheep belonging to the shepherds.

To make a farm quite complete, there ought also to be grafs for six or seven cows, five horses, and, if possible, a hundred acres of arable ground, for corn, hay, and turnips; but so complete a farm is rarely to be met with.

The great advantage of such a farm is, that when once it is well stocked, there is no occasion for *buying* any thing, the farmer having only to dispose of his draft ewes and widders, when they come to be of a proper age for sale; whereas, on smaller farms, it is hardly possible to breed one's own stock, and to keep them on until they can be sold to the best advantage; and a farmer that is obliged both to buy and to sell, has not only a more troublesome, uncertain, and expensive occupation, (being obliged to attend many more markets, and
having

having a greater number of people to deal with), but this chance of profit, it is evident, must be doubly precarious.

The division of the stock into different *hirsels* is an excellent part of the Cheviot management. In large stocks they carry it the length of seven *hirsels* in summer, and six in winter; namely, 1. Lambs. 2. Hogs. 3. Gimmers. 4. Dinmonds. 5. Ewes. 6. Three and a half-year-old wedders; and 7. In summer, a *hirsel* for summer lambs. On this plan, every part of the flock can be sent to that part of the pasture for which it is best calculated; and young ewes are prevented from breeding too early, before they come to their full strength, by which a stock is very apt to be materially injured.

The extent of a Cheviot farm varies according to the goodness of the pasture, but, in general, the calculation is about a sheep to an acre; though good land will maintain more, and bad land not so many.

The calculation of the rent to be paid for such a farm is a very important consideration. It has, of late, been greatly on the increase; and, in the opinion of some, is getting so high, that unless there is the same demand for stock that exists at present, and unless the fleece is greatly improved in value and in price, the rents now insisted on, may, in some cases, be found too high. The common calculation, according to the old rates, was as follows:

600 ewes, at 5 <i>s.</i> for the pasture of each ewe,	£. 180	0	0
370 wedders, at 3 <i>s.</i>	-	-	55 10 0
160 young ewes, at 2 <i>s.</i> 6 <i>d.</i>	-	-	20 0 0
370 dinmonds at 2 <i>s.</i>	-	-	37 0 0
500 lambs, or hogs, at 2 <i>s.</i> 6 <i>d.</i>	-	-	62 10 0
			Total
			£. 325 0 0

This was the old rent; but a farm that would pasture 2000 Cheviot sheep, if it is well situated, and the pasture wholesome, and not subject to disease, will now yield the average rent of from 5*s.* to 6*s.* for the pasture of each sheep, and perhaps in some cases more.

The profit to be derived from such a farm is, as it ought to be, considerable; the following being the amount at which the annual sales may be estimated:

1. 2000 fleeces, at 3 <i>s.</i> each,	-	-	£. 300 0 0
2. 160 draft ewes, at 13 <i>s.</i>	-	-	104 0 0
3. 370 three-year old widders, at 20 <i>s.</i>	-	-	370 0 0
Total			£. 774 0 0*

Besides some draft lambs, the produce of which is uncertain; but, on the whole, there would be a return, after paying 400*l.* of rent, of about 374*l.* *per annum* for profit, contingencies, interest of money, &c. Such is the return at present, but there can be no doubt that, by improving the quality of the wool, the fleece of the Cheviot breed may be brought to 5*s.* a piece, which would be an addition of 200*l.* to the above sum; making the produce of each sheep about 10*s.* and the income from such a farm about 1000*l.* *per annum*; so that sheep farming may be found as profitable an occupation, for a person of industry and talents, as any that can be followed. The value of the above stock of 2000 sheep, if they were to be bought at once, may be calculated at from 1200*l.* to 1800*l.* according as the market is ruled; but if the Cheviot breed were to be brought into a country where another breed had formerly been kept, or, which had been formerly appropriated for cattle, the following plan, for getting as quickly as possible into a stock bred upon the farm, (a point of very great importance) might be adopted.

Suppose the entry to your farm is in May; keep your pasture *fresh*, that is to say, without any stock upon it for two or three months, and about the end of July, or beginning of August, purchase about 20 three-year-old rams, and about 1000 of the youngest and best draft ewes you can get, which, at that time, can be bought for 13*s.* a piece; and, if purchased early, perhaps for 12*s.* as the store farmer thereby

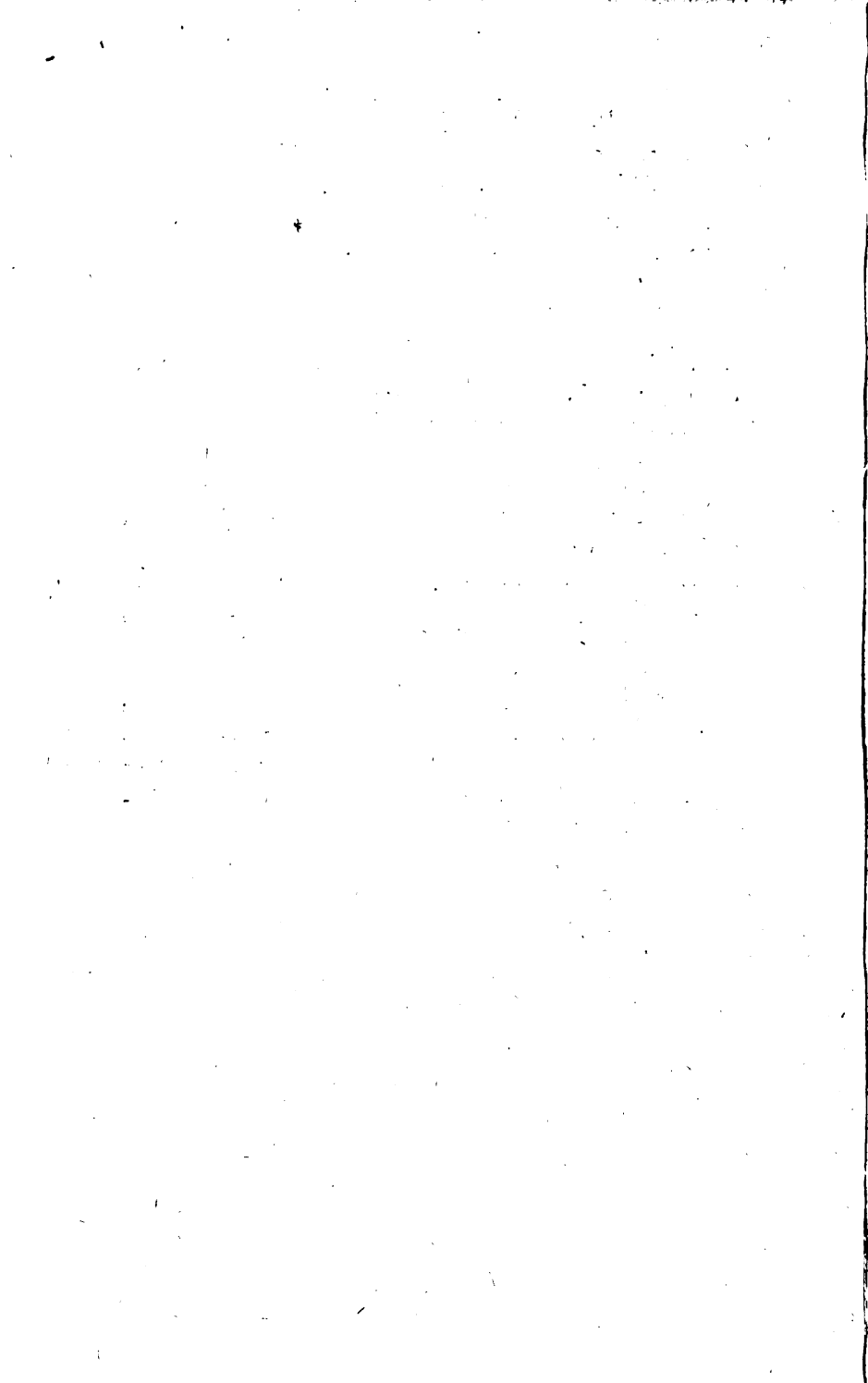
* The prices have since very considerably increased.

faves so much of his pasture. On that plan, the price of your stock would be as follows :

1000 draft ewes, at 13s.	-	•	£. 650 0 0
20 rams, about	-	-	50 0 0
			£. 700 0 0
		Total	£. 700 0 0

Some, however, prefer buying what are called heavy ewes in spring, though, in that case, they cannot be driven very far. But, at any rate, every one must perceive at what an inconsiderable expence a farm producing such great returns may be stocked.

From the preceding observations, some idea may be formed of the great profit that may be derived from covering the mountains of England and Scotland with a fine wooled breed of sheep. It is to be hoped, that the time is not far distant, when mountain sheep will yield at the rate of 10s. a-piece *per annum*, and when the income to be derived from a flock of 2000 such sheep will be about 1000 *l. per annum*. There are few tenants, and still fewer proprietors, either in the Highlands, or in the southern parts of Scotland, or in the hilly districts of England, to whom this ought not to be a most important piece of information.



ESSAY VI.

ADDRESS

TO

THE BOARD OF AGRICULTURE,

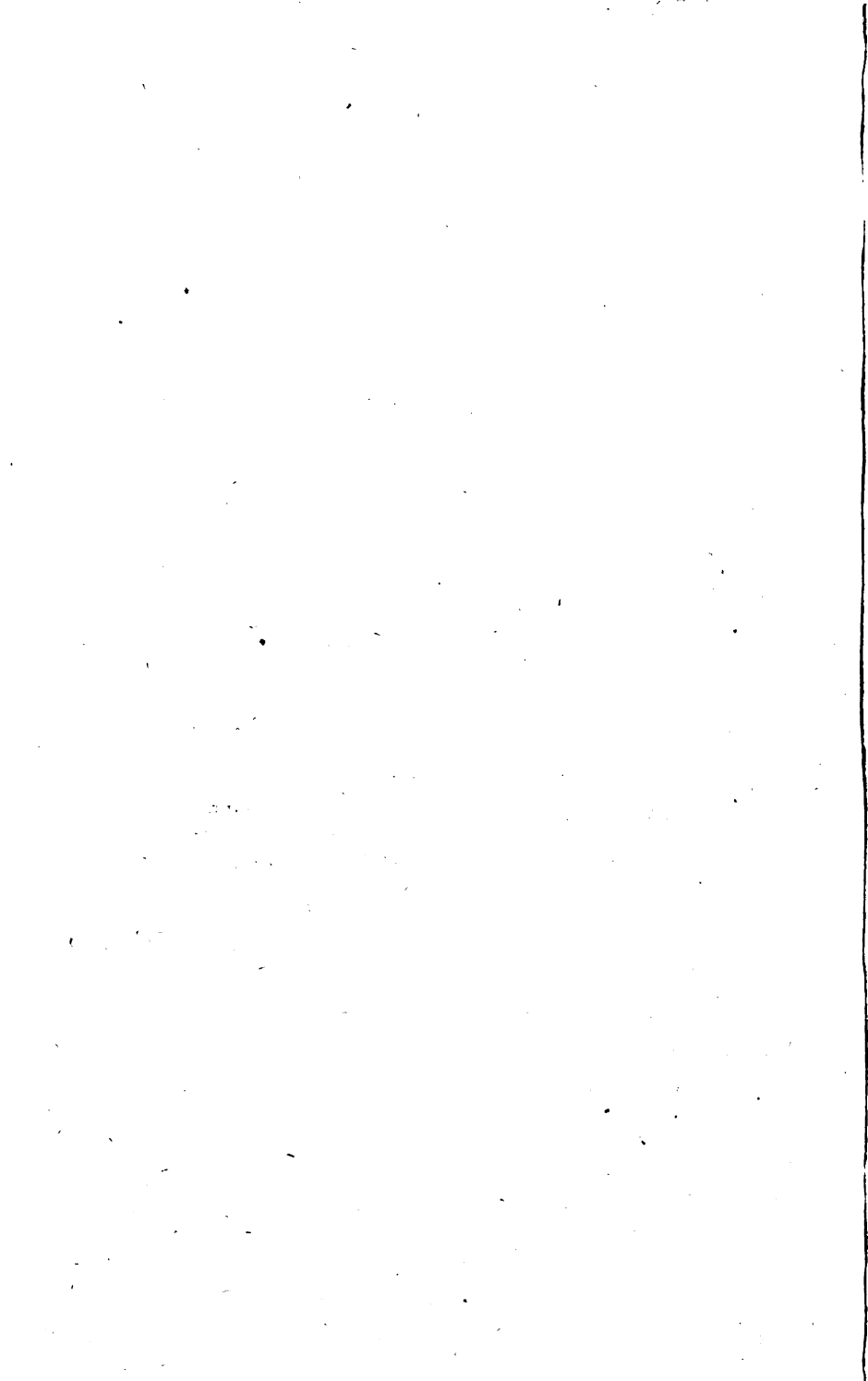
ON

THE CULTIVATION AND IMPROVEMENT .

OF THE

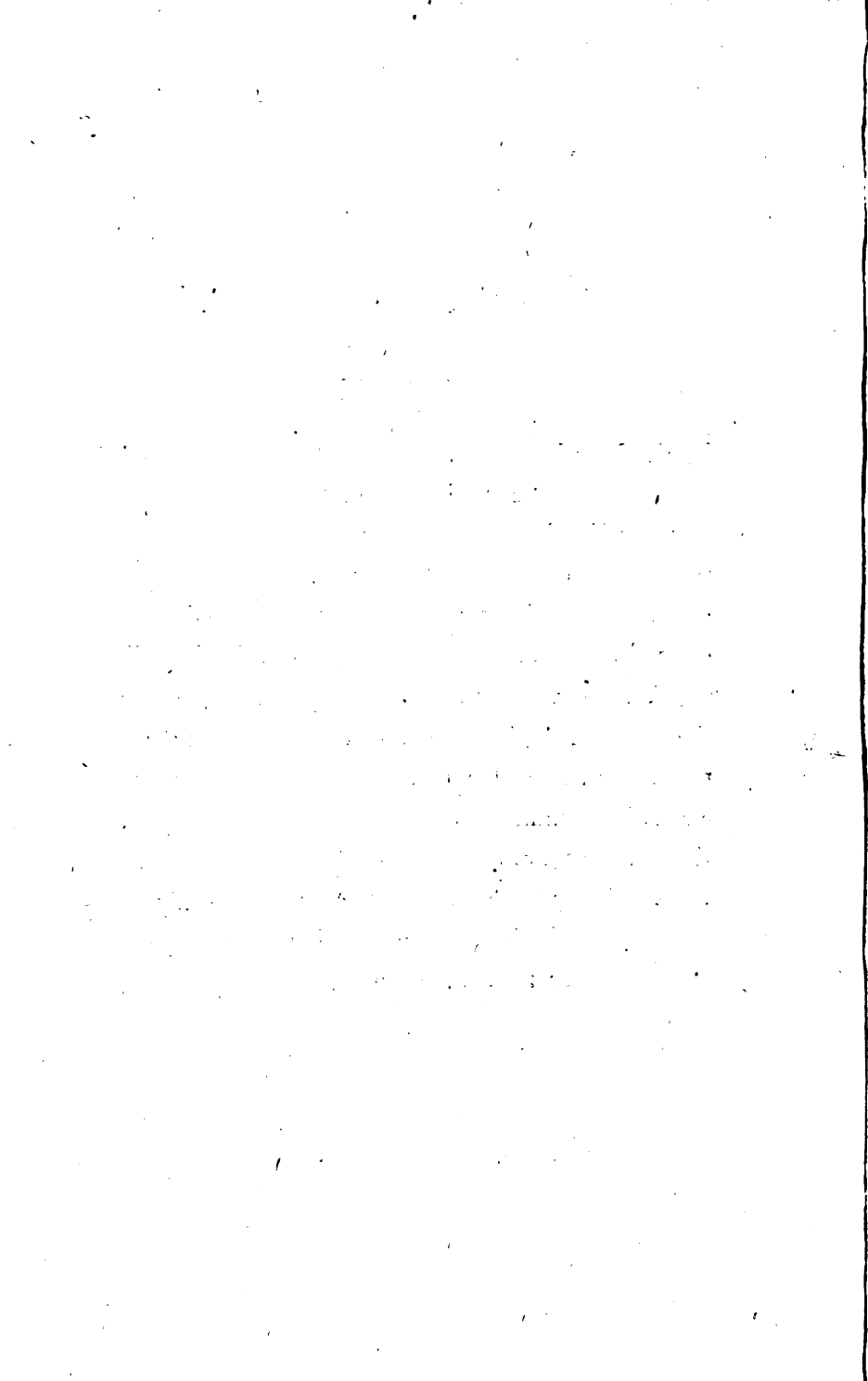
WASTE LANDS OF THE KINGDOM.

**Presented to the BOARD, by Sir JOHN SINCLAIR (then President),
on the 17th November, 1795.**



ADVERTISEMENT.

FOR several years my attention was much occupied, in promoting the cultivation of our waste and other unproductive lands, and in attempting to remove various legal obstacles which prevented their improvement. As far back as the year 1795, I endeavoured to explain the importance of the subject in the following Address, which was originally printed by order of the Board of Agriculture, and was afterwards annexed to a Report presented to the House of Commons, by a Select Committee, appointed *Anno* 1796, to consider the means of improving the Waste Lands of the Kingdom. But as these documents are not generally accessible, I thought it might not be improper to preserve the Address in this Collection.



ESSAY VI.

ADDRESS TO THE BOARD OF AGRICULTURE,

ON THE

Cultivation and Improvement of the WASTE LANDS
of the KINGDOM, 17th November, 1795.

INTRODUCTION.

AT the conclusion of the preceding session, I had the honour of stating to the Board, my intention of laying before it some observations on the cultivation and improvement of the waste lands of the kingdom, a subject at all times of great importance, but peculiarly so at the present moment, when the nation is under the necessity of looking to foreign countries for a part of its subsistence. Fortunately, however, we have resources in our power, if properly called forth, more than sufficient to prevent the necessity of depending in future upon other countries for any of the necessaries of life. To point out the means of bringing such resources into action, and to explain the advantages to be derived from them, is the object of this Address.

For the purpose of stating the subject with the greater perspicuity, I shall consider it under the following heads :

- I. The circumstances which occasioned, in ancient times, the existence of such an extent of waste lands and commons in the kingdom, including those which have hitherto retarded their improvement.

II. An

- II. An estimate of the extent of those waste lands, in so far as the same can be ascertained, and the probable resources to be derived from their cultivation and improvement.
- III. The different kinds of rights of common, which exist in the kingdom, and are known in law.
- IV. The law, as it now stands, for the division of wastes and commons; and such alterations as have been suggested, for the purpose of facilitating such divisions.
- V. The law and practice of North Britain, in regard to the division of such lands, where a general act for inclosing commons has long been established; with the improvements which can be made therein.
- VI. Some general observations on the many public advantages, and the many private benefits, to be derived from the division and improvement of such lands.

SECTION I.

On the Circumstances which anciently occasioned such an Extent of Waste Lands and Commons, and those which have hitherto retarded their Improvement.

In tracing the circumstances which anciently occasioned such an extent of waste lands and commons in the kingdom, and those which have hitherto retarded their improvement, the inquiries for that purpose were much facilitated by the information found, not only in the Reports transmitted to the Board on the Agricultural State of the Kingdom *, but also in the writings of several intelligent authors who have incidentally

* See, in particular, the Agricultural Account of Wilts, p. 15.

treated of that subject *. It would thence appear, that England was anciently divided into districts, the extent and value of which varied extremely. Certain portions of these districts, under the name of demefne lands, reserved to the lords and barons of the several divisions, were possessed by the proprietors themselves, and cultivated for their use and behoof, by their servants and vassals, the latter of whom had frequently lands granted to them in fealty, subject to the above, and to other services of a feudal nature. In process of time, as population increased, other portions of land were granted by the lord, which the tenants of the manor occupied as common fields and meadows, part of which was kept in grass, for pasturage, or for hay, to secure winter provision for their cattle, and the remainder was cultivated for grain. The residue was called the Lord's Waste, and being considered of little value, the tenants of the manor were permitted to take from it turf for fuel, wood for the purpose of building or repairing their houses, constructing their instruments of husbandry, &c. : and on the herbage, the cattle, sheep, and horses, both of the lord and of his tenants, found the scanty means of subsistence. The first portion was held in fealty, and at an early period was inclosed, to prevent the encroachments of the farmers in the neighbourhood. The second, whilst the crop was upon the ground, whether meadow, grass, or

* Blackstone's Commentaries, Vol. II. p. 90.—Marshal's Rural Economy of Yorkshire, Vol. I. p. 48.—Remarks upon the History of the Landed and Commercial Policy of England, Vol. I. p. 133.—And the Elements of Commerce and Theory of Taxes, by Dean Tucker; a work which the author printed, and distributed among his friends, but never published, though a most valuable performance.

grain, belonged exclusively to the persons to whom it was granted, and by whom it was respectively occupied in severalty; but no sooner was the crop secure, than it reverted into a state of commonage, among all the persons who had grants of lands in such common fields. The third division always remained in common, subject to a variety of regulations, according to the customs established in the different manors, whether the common was stinted or unstinted, or whether more than one manor or township happened to be interested in the same waste. Such were the circumstances, joined to the scanty population and defective agriculture of the country at that time, to which the great extent of waste lands in the kingdom are to be attributed: In addition to which it may be observed, that in various parts of the kingdom, vast tracts were appropriated to the use of the sovereign, under the general name of forests or chafes, for the purpose of enabling him to enjoy the great source of amusement in those days, the diversion of hunting and hawking without molestation or encroachment.

The idea of having lands in common, it has been justly remarked, is to be derived from the barbarous state of society*, when men were strangers to any higher occupation than those of hunters or shepherds, or had only just tasted the advantages to be reaped from

* It is observed in the County Reports, that those who live in the neighbourhood of great wastes, are still an idle and lawless set of people, Brecknock Report, p. 40 and 42. Radnor Report, p. 16. That such commons are the frequent resort of thieves and other predators on the public. Lincolnshire Report, p. 23.—And are on that account, but particularly near the capital, a public nuisance. Foote's Middlesex, p. 30.

the cultivation of the earth. But when once such a mode of occupancy, however disadvantageous, is established by long custom, it is extremely difficult to bring about an alteration, more especially if there are any circumstances which lead any number of individuals of the society to imagine, that it is for their own private interest to support the existence of such a custom, or if any obstacles render the means of altering that system, either troublesome or expensive.

This leads me briefly to state the objections which have been made to the improvement of waste lands, and the obstacles which have hitherto prevented their cultivation.

In the first place it has been urged, that the improvement of wastes has a tendency to depopulate the country, by diminishing the number of cottagers, who reside in their neighbourhood; and who, in a great measure, exist, as it is supposed, by the miserable profits derived from them. Such an idea, however, is as little justified by experience, as it is evidently contrary to reason and common sense. It is impossible to suppose that the poor should be injured by that circumstance, which secures to them a good market for their labour (in which the real riches of a cottager consists), which will furnish them with the means of constant employment, and by which the farmer will be enabled to pay them better wages than before. If a general bill for the improvement of waste lands were to be passed, every possible attention to the rights of the commoners would necessarily be paid; and as inclosures, it is to be hoped, will, in future, be conducted on less expensive principles than heretofore, the poor evidently stand a better chance than ever of having their full share undiminished. Some regulations also must be inserted in the bill, to

secure the accommodations they may have occasion for, by enlarging, where circumstances will admit it, the gardens annexed to their respective cottages, giving them a decided preference with respect to locality over the larger rights, throwing the burden of ring fences upon the larger commoners, and allotting, where it is necessary, a certain portion of the common for the special purpose of providing them with fuel; and thus the smallest proprietor will in one respect be obviously benefited; for any portion of ground, however inconsiderable, planted with furze or quick-growing wood, and dedicated to that purpose solely, would, under proper regulations, be as productive of fuel as ten times the space where no order or regularity is observed. If by such means the interests of the cottagers are properly attended to, if their rights are preserved, or an ample compensation given for them, if their situation is in every respect to be ameliorated, it is hoped that the legislature will judge it proper and expedient to take such measures as may be the best calculated for bringing into culture so large a portion of its territory, though it may not accord with the prejudices of any particular description of persons, whose objections evidently originate from the apprehension, rather than the certainty of injury, and who will consider it as the greatest favour that can be conferred upon them, when the measure is thoroughly understood*.

In

* The advantages which not only the public but the cottagers derive from the inclosing of wastes, under a proper system, is happily exemplified in one of the Reports laid before the Board, from which the following particulars are extracted:

“ The commonable land belonging to a parish in Worcesterfhire, which is situated very near to Tewksbury, in Gloucesterfhire, was inclosed about twenty-two years ago; and there was an allotment, containing

In the second place it is said, that commons are an excellent nursery for rearing young cattle, and consequently ought to be preserved. No idea however can possibly be more absurd. If any person will take the trouble of comparing the stock on any common, with those to be found in the neighbouring inclosures, they will soon

“ containing twenty-five acres, set out for the use of such of the
 “ poor as rented less than ten pounds a-year, to be stocked in com-
 “ mon. At that time there were about sixteen people on the parish
 “ books, some of whom had families. Previous to the inclosure,
 “ there were some few cottages that had land let with them, to the
 “ amount of six pounds or seven pounds a-year each. The occu-
 “ piers of these cottages, with land annexed to them, were remark-
 “ able for bringing up their families in a more neat and decent man-
 “ ner than those whose cottages were without land, and it was this
 “ circumstance which induced the lord of the manor (to whom
 “ almost the whole of the parish belonged) to lay out a plot of
 “ lands (besides the common beforementioned) to other of the cot-
 “ tages, and to add a small building, sufficient to contain a horse or
 “ a cow, and likewise grafting stocks to raise orchards. In some
 “ instances, small sums of money were lent to these cottagers, for the
 “ purchase of a cow, a mare, or a pig.

“ The following good effects have been the consequence of this
 “ proceeding. It has not, in one instance, failed of giving an in-
 “ dustrious turn even to some of those who were before idle and
 “ profligate. Their attention in nursing up the young trees has
 “ been so much beyond what a farmer, intent upon greater objects,
 “ can or will bestow, that the value of the orchard is increased to
 “ forty shillings per acre, in land which was of less than half the
 “ value in its former state. And the poor's rates have, from this
 “ cause, fallen to four-pence in the pound or less, there being only
 “ two (and those very old) people on the books at this time, whilst
 “ the adjoining parishes are assessed from two shillings and sixpence
 “ to five shillings in the pound. These are labourers, and good
 “ ones; their little concerns are managed by their wives and children,
 “ with their own assistance, after their day's work. Their stock
 “ consists of a cow, a yearling heifer, or a mare to breed (from which

seen be satisfied of the contrary. That commons are well calculated for stunting the growth, or rather starving animals of every description, those who pasture their stock upon them, have in general experienced. Where the right of common is unlimited, as Dean Tucker justly observes, the ground is so overstocked with numbers, that no large-sized or generous animal can be bred upon it, and even where the right is limited, frauds may be committed, and the stint is in general so large, that in unfavourable seasons, the commons, though under limitation, are of little use. In regard to feeding lambs, colts, or calves, it is apprehended, that grounds free from disease, and inclosures properly watered and sheltered, can afford grass better and more plentiful, and rear them on the whole to more advantage, than wild barren commons over-run with heath, furze, fern, or brush-wood*.

“ a colt half a year old will fetch from 3*l.* to 5*l.*) a fow, and 30 or 40 geese. This, therefore, has been the means of bringing a supply of poultry and fruit to the market, of increasing population, and making land produce double the rent a farmer can afford to give.” Davis’s Oxford Report, p. 34.

Who would not wish to see every waste in the kingdom improved on such principles? and how much will not the situation of every cottager be ameliorated, if such a system were to be adopted?

* The difference between the size of cattle and sheep now, and in the reign of Queen Anne, when half the stock of the kingdom were fed on commons, is hardly to be credited. In 1710, the cattle and sheep sold at Smithfield market weighed, on an average, as follows:—Beeves 370 lb. Calves 50 lb. Sheep 28 lb. Lambs 18 lb. Now it may be stated, Beeves 800 lb. Calves 148 lb. Sheep 80 lb. and Lambs 50 lb. The increase is principally, if not solely, to be attributed to the improvements which have been effected within these last 60 years, and the feeding of our young stock, in good inclosed pastures, instead of wastes and commons.

The

The only remaining objections, entitled to consideration, are, the heavy charges and other difficulties attending the division of commons, and, even after they are divided, the expence necessary for their improvement, which does not always repay the proprietor the charges which it costs him.

These are, in fact, the only obstacles which prevent the public from speedily receiving all the extensive and various benefits which may be expected from the cultivation of our waste lands; and, fortunately, these are obstacles, which, it is to be hoped, will be speedily removed by the exertions of the Board of Agriculture. In regard to the expence and difficulty attending the division of commons, which are so great, that where the common is small, the expence of obtaining an act, particularly if contested, would do more than improve the land in question, there can be little doubt that the Legislature will remove every obstacle of that nature, when once the many important advantages to be derived from facilitating the division of wastes are pointed out; and as to the expence of improvement, it is to be observed, that as the proprietors of such wastes will, in future, have their share allotted to them at a very inconsiderable expence, the money they are able to lay out, instead of being exhausted in procuring a division, will be expended on the improvement of the soil, and in many cases will be sufficient for that purpose. There will then be but little risk of the proprietor wanting a sufficient return for the capital expended. Besides, when the Board of Agriculture shall have collected into one focus the result of the experience of the whole kingdom, in regard to the best mode of rendering waste lands productive, such improvements will be no longer a matter of doubt, nor the means of effecting them

uncertain. The proprietors of such wastes will no longer be under the necessity of discovering, by means of expensive experiments, the best means of improving their property, but they will at once be able to determine, how to render any portion of the waste allotted to them, productive and valuable.

At present, a right of common is seldom of much advantage to those who enjoy it. From the Westmoreland Report it appears, on the most unquestionable authority, that the liberty of keeping ten sheep, for a whole year, may be hired for sixpence; and as it is supposed to require six acres to maintain that number of sheep, the rent of such land, therefore, is only a penny an acre, and the price of the fee-simple of it, at twenty-four years purchase, two shillings *. In Wales, where the commons are probably better, four-pence *per head per annum*, is the rate of keeping a sheep on such ground, and other cattle in proportion †. In many parts of the kingdom, however, it would appear from several of the Reports transmitted to the Board, that many decline availing themselves of such a privilege, finding that it does not, on a fair calculation, pay even common interest for the capital employed ‡. The following case puts, in the strongest point of view, how that even a loss may be sustained by commonage. Let

* See the Bishop of Llandaff's Preliminary Observations to the Westmoreland Report, p. 8. The learned and respectable Prelate justly adds, "That whilst there is an acre of such waste improveable land in Great Britain, it may be hoped, that when the Legislature shall turn its attention to the subject, no inhabitant of this island will be driven, by distress, to seek a subsistence in Africa or America."

† North Wales Survey, county of Flint, p. 3.

‡ See Devon Report, p. 52 and 53. Lincoln Report, p. 28. Baird's Middlesex, p. 23, and particularly Radnor Report, p. 25, and Wilts Report, p. 136

one man, having a right to do so for nothing, put a cow of any value upon the generality of commons, any time in spring, and let another give a farmer 1s. 6d. a week for the keep of his cow in an inclosure, both being of the same value when first turned out; if both are driven to market at Michaelmas, the difference of price will do more than repay the expence of the keep, without making any allowance for the additional quantity of milk which the cow, kept in an inclosure, must yield*. In regard to sheep, if they are of a valuable sort, the profit of hiring land, instead of putting them on a common for nothing, is still greater †. And the enormous losses sustained by that species of stock, when the rot, or any infectious disorder gets into a neglected flock, can hardly be calculated. Can there then be stronger arguments in favour of giving every possible assistance and facility to the improvement of our waste lands, which at present are, in many cases, a real loss to the community, and a prejudice to those who might be supposed to derive some benefit from them, but which, if improved, might add millions to the national wealth, and furnish the means of occupation and subsistence to millions of additional subjects.

* By some it is asserted, that if a cottager purchases a cow in spring, and keeps it upon a common during the best season of the year, and afterwards sells it at Michaelmas, that the difference of the price runs away with all the profit that could be got from the milk, &c. Even in stinted pastures, which are likely to be the most profitable, the advantages are very inconsiderable, and nothing in comparison to those which the same lands would produce under a proper system of cultivation. A cow turned on a common may get her own living for three months, which is as much as she will be able to do, without some assistance from the garden, bran, &c. and such a cow, being obliged to be on foot all the day, and perhaps at night too, gives but a very scanty meal when milked. Foote's Middlesex.

† See Leicester Report, p. 57.

SECTION II.

On the Extent and Value of the Waste Lands in the Kingdom.

It would certainly have been extremely desirable to have been able exactly to ascertain the extent of waste land in the kingdom; but that could not be effected without an expence to which the funds of the Board were totally inadequate. It is a subject, however, which may be well entitled to the consideration of Parliament, Whether a survey of them ought not to be made, either at the public expence, or at the charge of those to whom the property of such wastes principally belong? In the interim, the following rough estimate of their magnitude and extent, partly founded on the Reports transmitted to the Board by its different Surveyors; partly on calculations made from the county maps, where they have distinguished the waste from the cultivated land; and partly, where both these sources of information failed, from such other means of calculating as it was possible to have access to; will give some idea of the extent of the kingdom, and the proportion of the waste and uninclosed, to the cultivated part of it.

General View of the extent of the Island of Great Britain, and the proportion between the waste and uninclosed, and the cultivated part thereof.

ACRES.			
	Uncultivated.	Cultivated.	Total Extent.
England and Wales	7,888,777	39,027,156	46,915,933
Scotland - -	14,218,224	12,151,471	26,369,695
	22,107,001	51,178,627	73,285,628
Uncultivated -		22,107,001	
Total - - -		73,285,628	

The above estimate will give some general idea of the magnitude of this great source of future national wealth. From it, there is too much reason to believe, that no less a quantity than twenty-two millions remains uninclosed and uncultivated. What a difference would it not make in the state and prosperity of this island, were only one half of those extensive wastes, in the words of one of the Reports*, “to wave with luxuriant crops of grain—be covered with innumerable herds and flocks, or clothed with stately timber †!”

OF

* Westmoreland Survey, p. 53.

† There is a circumstance also, of which it may not be improper to take notice in this place. The waste lands above enumerated are not only uncultivated themselves, but they have a tendency to make the farmers in the neighbourhood neglect the improvement of the lands they enjoy in severalty*. The dung of the stock kept on the waste, unless where the system of sheep-folding is adopted, is evidently lost; and when once a person learns to become careless of one article, the same spirit of inattention soon spreads to others of perhaps greater importance: and so infinitely superior does land appear, when cultivated even in the most slovenly manner, compared to the adjoining waste or common, that there is but little call for exertion.

* Brecon Rep. p. 39.

After

Of the value of these wastes, were they improved in the manner of which they are capable, it is difficult to form any adequate idea. At the same time it may be of service to state some data, as the basis of future calculation. On the supposition, therefore, that there are twenty-two millions of acres of waste and uninclosed lands in the kingdom, the whole may be divided, according to the various qualities of the soil and surface, in the following manner ;

	N ^o of Acres.
Lands incapable of all improvement	1,000,000
Lands fit to be planted - -	3,000,000
Lands fit for upland pasture .	14,000,000
Lands fit for tillage * * *	3,000,000
Lands capable of being converted into meadow, or water meadow	1,000,000
Total	22,000,000

The million of acres stated as being incapable of cultivation, must be estimated as of no annual value.

The three millions of acres supposed to be fit for plantation, according to the ingenious calculation of the

After making such a comparison, the husbandman is too apt to sit down completely satisfied with the wonderful progress he has already made, though he has reached, perhaps, only the first stage of improvement. Besides, there is here every encouragement to idleness. A farmer thus situated, naturally depends upon the imaginary profits to be derived from the adjoining commons, for the summer sustenance of his stock, an advantage which he enjoys *gratis*, and thence he flatters himself that he can subsist without the drudgery of hard labour, to which the proper cultivation of his farm would unavoidably subject him. Such circumstances as these, operating in a greater or lesser degree along the margins of all our wastes, and affecting the cultivation of the inclosed land in their neighbourhood, must, on the whole, be productive of very considerable national loss.

Bishop of Llandaff, may be worth eight shillings *per* acre, or, in all £. 1,200,000 *per annum* *. This, however, is the value of the annual produce, and not rent.

The fourteen millions of acres of upland pasture, when improved, cannot be calculated at less than 5s. *per* acre of rent, or £. 3,500,000 *per annum*.

The three millions of acres, supposed to be convertible into arable land, would certainly, when inclosed, be worth, at an average, 10s. *per* acre, or £. 1,500,000 *per annum*.

The million of acres supposed to be converted into meadow, or water meadow, cannot be calculated at less than £. 1 10s. *per* acre, or £. 1,500,000 in all.

The account may then be thus stated :

Rent of the upland pasture	£. 3,500,000
Rent of the arable land	- 1,500,000
Rent of the meadows	- 1,500,000
	6,500,000
This must be multiplied by 3, in } order to give the annual pro- } duce " " " " " " " " " " " " }	3
	19,500,000
Add the annual produce of the three millions of acres supposed to be planted, amounting to	1,200,000
Total	£. 20,700,000

It

* See Preliminary Observations to the Survey of Westmoreland, p. 10. The Bishop calculates, that a barren estate, consisting of 1,000 acres, though placed in a high and bleak situation, may be improved by plantation from £. 4 3s. 4d. to £. 400 *per annum*, or

It has been already stated, that in many instances waste lands and commons are let even for *1d. per acre*; and in others, that persons do not think it worth their while to avail themselves of the privilege of sending stock to pasture on them; and that it is a right often attended with loss instead of benefit. At the same time these wastes must produce something. Having calculated, however, the improved produce under *20s. per acre*, it is impossible to estimate the present value at above one tenth of that sum, or *2s. per acre*, as the average of the whole kingdom. This, amounting in all to $\pounds. 2,100,000$, for twenty-one millions of acres, it is probably as high as that produce is really worth, more especially collected as it is from extensive and uncultivated wastes, under every possible disadvantage.

These calculations, however imperfect, will, it is hoped, furnish the Board with some idea of the magnitude of this object in a national point of view; and when to that is to be added the great advantages to be derived from the improvement of land at present under a defective system of cultivation, it is difficult to hazard the naming of any sum for the total additional income which the people of this island may derive from agricultural improvements, without being suspected of

8s. per acre, reckoning the value of a reversion as a present certainty, and stating the interest of money only at $\pounds. 4$ per cent. In other places, however, more favourable to the growth of trees, the profit is estimated much higher. In the Hampshire Report, in particular, p. 30, it is stated by two very experienced nurserymen, that even poor land, when planted, will produce *per acre*, at the end of twenty-five years, at least $\pounds. 100$ of value in timber and fire wood. In Scotland, Dr. Robertson states the profit at *6s. per acre*; Perth Report, 107. The Bishop seems to have hit on a just and proper medium, applicable as an average to the whole kingdom.

exaggeration,

exaggeration, at least by those, who, unaccustomed to trace the effects of industry and exertion, except in small districts, cannot at once enter into the spirit and justness of calculations, which include in them all the possible improvements of which an extensive kingdom is capable.

It certainly, however, would be in the highest degree imprudent to act as if the resources above stated were already in our possession, or immediately within our reach. Such an addition to the annual income of the people, as the sum above hinted at, to be obtained even from our wastes alone, cannot be secured, without great industry, considerable exertion, some time, and much expence*. It is, at the same time, some consolation to have the prospect of such an addition to the national capital and income opened to our view; as, in process of time, it must necessarily tend to alleviate the burden of those debts and taxes, to which this country is already, or may in future be subject.

SECTION III.

Of the different Sorts of Rights of Common, known to, or acknowledged by, the Laws of England.

It seems unnecessary to enter much at length into a definition of the different rights of common, at present known to, or acknowledged by, the laws of England; because

* The expence of improving these wastes must be considerable, but at the same time does not properly come within the purview of this

because I trust and hope, that by a division of all wastes and commons, every right of that description will be extinguished. At the same time it may not be improper shortly to state the nature of such a right in general, and the various distinctions of which it has been found susceptible.

A right of common is, in general, understood to be "a profit which one person hath in another's land, without having any property in the soil." It is an incorporeal right, originating in some real or supposed agreement between lords and tenants, incident to some tenure for valuable purposes, or founded on long possession.

This right of common is divided according to the subject matter :

1. Into common of pasture ; which is a right of taking the produce of land by the mouths of the cattle.
2. Common of turbarry ; or the right of cutting turves (turf) for fuel.
3. Common of estovers ; or the right of cutting wood for fuel, for the repairs of the house, implements of husbandry, for making fences ; and,
4. Common of piscary ; or the liberty of fishing in another's water. The consideration of the last particular is foreign to the object of our present inquiries*.

this Address, as that expence is defrayed, not by the public, but by individuals, who dedicate their labour and capital to that object. As well might we deduct, in estimating the value of foreign commerce, the expence of the ships, provisions, &c. and even of the fleets necessary for its protection.

* In some parts of England also there is a common of fowling, or a privilege of killing wild fowl ; and a right of falcage, by which is meant the right of cutting hay in a common meadow, according to the custom of the manor.

The material variation between the different rights above stated, consists in the subject matter—common of pasture, being a right of feeding on the verdure and herbage of the soil; but, common of turbary conveys a right of carrying away the very soil, or the produce of the soil itself: In other respects they resemble each other; so that it seems necessary to be particular only in illustrating the right of common of pasture.

Common of pasture is divided, technically, as follows:

1. Common appendant.
2. Common appurtenant.
3. Common in gross; and,
4. Common because of vicinage.

Common appendant, is incident of common right to all who hold land parcel of a manor, and is a right to depasture their commonable cattle, (such as horses, oxen, cows, and sheep,) which are necessary either for the cultivation or manurance of their lands, and levant and couchant thereon, upon the wastes of the manor.

It must have had its origin before time of legal memory, for at this day no such right can be created: As where the lord of a manor, before the statute of *quia emptores*, enfeoffed another of lands parcel of the manor, the feoffee became entitled to common, for his commonable cattle, levant and couchant on the lands granted, within the wastes of the lord, as incident to the feoffment.

The soil of the land subject to this species of right, is in the lord of the manor; and thus the lord and his tenant have a mixed enjoyment of the property; and it is laid down to have originally belonged to arable land only, though now it may be claimed as belonging to meadow or pasture.

Common appurtenant, is a right belonging and appertaining to land, but not incident to any tenure. It must have its commencement by grant, and therefore may be erected at this day. As where a man sells land to another, and grants therewith a right of common over certain of the feller's lands, this right shall be held as appurtenant to the lands sold.

From the nature of its origin it may extend to every species of cattle, such as swine, and also to geese. It may be limited to a certain number of cattle; or it may extend to all cattle *sans nombre*: But it is apprehended, that such a right cannot be extended beyond that number which the land to which the common is appurtenant can maintain throughout the year; or, in other words, they must be levant and couchant thereon.

Common in gross, is where common appurtenant to lands has been alienated, and is held separate from the lands to which the common was appurtenant, and differs not from common appurtenant in any other particular, than by what necessarily attends such disannexation; *viz.* in its descendible quality through the same invariable line of descent from ancestor to heir, and not as an accessory to land. And from hence arises the distinction in the mode of claiming common appurtenant or in gross; the former claimant, stating his title to arise from an immemorial usage, by all antecedent owners and tenants of the land to which the common is appurtenant; and the latter claiming an usage by himself and his ancestors for time immemorial.

Common because of vicinage, is not properly a right, but is merely an excuse for a trespass; and is where two or more towns have common in the fields within their

their townships, which are open to the fields of the neighbouring townships. The cattle put to use their common have been immemorially used to escape into the fields of the neighbouring towns, and therefore by inclosure of the fields of one or more townships, the common because of vicinage may be extinguished.

All these species of rights of common, except where a particular grant can be shewn, must be prescribed for and proved by long and immemorial usage, and uninterrupted enjoyment, and the mode of enjoyment must point out the nature of the prescription; for they must agree with each other: As, if the common has been used for other than commonable cattle, the claim must be of common appurtenant, and so of the rest.

Whatever difficulties may occur in considering these different rights, they evidently have arisen from the necessity of holding out an inducement to the cultivators of land in ancient times, before the use of artificial pastures was known, to continue their land in an arable state, by annexing to such land a sufficiency of common for the support of their cattle. For this purpose, the policy of the common law annexed this right to all grants of lands by a lord of a manor, as incident to such grant; and the same policy might have prevailed in the grants of private persons, as the most effectual security for the payment of the reserved rent, and due cultivation of their lands.

The only other distinction which it seems necessary to take notice of is, where the right of common is either stinted, or where it is unlimited. In the one case, the right only extends to the power of putting a certain number of horses and other commonable cattle, at certain fixed times of the year, into such common pasture, under the denomination of cattle gaits; every cow or

ox being held equal to one cattle gait, every five sheep to one cattle gait, and every horse to one cattle gait and a half; the proportion, however, sometimes varying according to the ancient usages of particular districts. In many of these stinted commons the commoners are owners of the soil, which distinguishes their rights materially from those above mentioned.

The foregoing distinctions appear to be all that are necessary for the purpose of elucidating the nature of the several rights of common, now existing in the southern part of the united kingdom; and, aided by the general history of the country, they lead to this probable conclusion, That those rights could only have arisen in the infancy of agriculture, and of the arts therewith connected, which might render the existence of such rights necessary. But whatever circumstances might have occasioned such tracts of valuable territory to remain unoccupied and in common, at a time when land from want of population and skill was little in demand; yet in this age of extended population, of increased wealth, and of diffused knowledge in agriculture and its attendant arts, any intermixture of property in the same land, as being a great, and, in many cases, an unsurmountable bar to all improvement, is an evil of such magnitude, that to a Legislature, distinguished for its attention to promote the public interest, it need only be pointed out, in order to have it remedied.

SECTION IV.

*Of the Laws now in being for the Division of Commons ;
and the Alterations which might be made therein, for
the Purpose of facilitating such Division.*

It may not be improper, previous to submitting any new regulations for facilitating the division of commons, in the first place, to inquire into the nature of any proceedings for that purpose that already exist, whether founded on common or statute law, or in equity ; since it would be extremely desirable, that any alteration which might be thought necessary, should be as nearly accordant to the laws in being as possible, varying perhaps in the mode, yet agreeing in principle, so as to be the more easily and effectually carried into execution.

In regard to the common law, it appears that writs of partition and admeasurement, for the division of property, have existed at common law from time of earliest memory and record ; and such were the ideas which at all times were entertained, of the advantages to be derived by the public, from the enjoyment of property in severalty, that there have been cases where such proceedings have taken place in very ancient periods, and inclosures made and supported, in a manner the most favourable to promote such partitions, divisions, and inclosures*.

* In the Paper written by John Robinson, Esq. on Waste Lands and Commons (printed by order of the Board), from fol. 8, to fol. 18, both inclusive, may be found a full and accurate statement of the decisions of the courts, founded on the principles of the common law.

Of the statutes which have passed in aid of the common law, there are only two which require to be particularly noticed. The first is the statute of Merton*, which, according to Coke, was only an affirmance of the common law. By this statute, such lords of manors as reserved sufficient pasture to their tenants, were empowered to improve the residue. By another act †, all doubts were removed whether the lord of a waste could approve (give evidence of the sufficiency of common for such as were entitled thereto, that the remainder might be inclosed and cultivated) against his neighbours as well as tenants. These are the only statutes which have any important reference to the subject in question. It is hardly necessary to remark, how insufficient they were for bringing any considerable portion of waste lands into a state of cultivation. It was seldom that any common was sufficiently extensive to afford a surplus of any moment, after the claims of those who had right of common on it were satisfied. It was hardly possible indeed, in many cases, to ascertain what was a sufficiency of pasture; and where a common of turbary or estovers existed, the lord could not improve any part of that waste. The more opulent and powerful also the commoners of the kingdom grew, the more opposition they made, and the greater difficulty there was found in carrying on this proceeding; infomuch, that in modern times there is scarce an instance of an improvement, as it is technically called, having taken place.

Besides these proceedings, founded on the common and statute law, various determinations appear heretofore to have been made in the Court of Chancery. But

* 2 Stat. Merton. 20 Hen. III. cap. 4.

† Stat. West. 2. 13 Edw. I. cap. 4. 6.

from the difficulties and expence attending such proceedings, they have been long difused; and no other general means of obtaining a division of commons having been sanctioned by law, the parties have been compelled, where an unanimous consent could not be procured, and the common divided by arbitration, to apply to the Legislature for special Acts, in order to divide and to put into a state of severalty lands that otherwise would have remained waste, common, and uncultivated.

It is surely unnecessary for me to trouble the Board with any observation on the insurmountable bars which must lie in the way of improving, by far the greater proportion of such wastes as remain in common, if some less troublesome and less expensive mode of procuring a division, is not established. The practice of applying to Parliament cannot long continue to its present extent, if the heavy charges attending such a mode of proceeding (which are particularly severe when the common is of small extent), are not diminished. Many difficulties also arise in obtaining consents adequate to the rule at present laid down by Parliament, in consequence of the obstinacy and perverseness of those who, by the number of their votes, can defeat such a Bill in the outset, though probably they are but little interested in the ultimate division. Other objections also to this mode of dividing commons may be adduced; The time of the Legislature, it may be observed, may thus be taken up, and diverted from objects of more general importance than the division of any particular common can possibly be. The expence of employing solicitors in town; of sending agents and witnesses from the country; the charge of counsel, if any dispute arises; and the fees on passing of the Bill;—all these, when

joined together, furnish such a prospect of uncertainty, difficulty, and expence, as must put an end to all hopes of any general or extensive improvement of our wastes, unless some means are speedily adopted for the purpose of facilitating their division.

There are certain leading principles however, on which any alteration in the system of dividing commons ought to be founded; and these I shall endeavour shortly to explain.

1. It occurs to me as a matter particularly desirable, to encourage the division of commons by the parties themselves interested therein; and if they choose to nominate commissioners, that such commissioners shall be authorized under the provisions of the Act, to proceed to the appropriation or allotment of the land in question; and that no legal disability, if the parties are willing, shall stand in the way of such division.

2. If the parties are not all willing to consent to the division, that any two or more of them may apply to the Sheriff, the Grand Jury, the Quarter Sessions, the Judges of Assize, or the Court of Chancery, (for all these various descriptions of persons have been mentioned, and which ought to be preferred, Parliament alone can determine,) either for a jury, or for the appointment of commissioners, with powers similar to those in common bills of inclosure, to have their share allotted, upon being at the whole expence of the division, reserving a claim against the other parties interested, for a proportionable share of the expence, when their allotments are taken up, on the same principles as in the case of party walls. And here it may be proper to observe, as a fair and equitable principle, that if two or more persons, interested in a common, are willing to improve it for their own and the general benefit, it is hard

hard on individuals, and impolitic in regard to the public, if any set of men should have it in their power to prevent them. Persons having a right of common, are in effect, though not in law, like parceners or joint tenants (any one of whom can legally enforce a division of the property they hold in common); and if those who do not wish for a division of the waste, are not compelled to inclose and improve the portion reserved for them (which, however, they will soon find it their interest to do), nor to be at any expence until they take up their allotments; in that case, it does not occur how they can have any just cause for complaint, because others are permitted to cultivate their share of the land in question.

3. Where parishes in different counties intercommon, that the application be made to the Court of Chancery, to appoint commissioners for the purpose of dividing the same into parochial commons, on the petition of any one of the parishes interested therein.

4. Lastly, many complaints having been made of the remissness with which the commissioners sometimes proceed, and the exorbitant charges which they sometimes make, or expences which they occasion, that provision be made in the Bill, for the purpose of preventing such proceedings, or of furnishing the parties injured with the means of redress.

Such are the general outlines of the plan which I beg leave to recommend to the attention of the Board; in the formation of which, two great objects have been kept in view, namely,

1. " That all the proceedings connected with the division (unless where the common is situated in different counties, in which case the Court of Chancery must be applied to) shall take place near to the spot

“ where the common lies :” and, 2dly, “ That the
 “ form of proceedings should be attended with as little
 “ trouble and expence as possible.”

I am ready to acknowledge, that no plan can be formed at once on so vast and comprehensive a subject, that may not be liable to some objections ; but as the cultivation and improvement of so great a portion of the territory of the public is at stake, I trust that the measures above proposed, with such alterations and improvements as may render them as little exceptionable as possible will be adopted, that the division of commons may no longer be attended with any important difficulty ; any inconveniencies attending the measures suggested, as they are discovered in practice, may be amended by future regulation ; and ultimately the great object will be attained, that of giving every legal facility to the exertions of those who are desirous of augmenting the industry, the produce, and the cultivation of their country,

SECTION V.

On the Law and Practice of North Britain, in regard to the Division of Commons, and the Alterations which might be made therein.

If any person entertains an idea, that a general inclosing Bill is an impracticable measure, his doubts will probably be removed when he is informed that such an Act was passed about a century ago in Scotland, and has been found to answer the purpose thereby intended. As that Act is distinguished by its simplicity and conciseness, it may not be improper to give it a place in this Address,

“ *Act*

*Act concerning the dividing of Commonities, passed in
the Parliament of Scotland, 17th July 1695.*

“ Our Sovereign Lord, with advice and consent of
“ the Estates of Parliament, for preventing the discords
“ that arise about commonities, and for the more easie
“ and expedit deciding thereof, in time coming, sta-
“ tutes and ordains, That all commonities, excepting
“ the commonities belonging to the King and Royal
“ Burrows in burgage, may be divided at the instance
“ of any having interest, by summons raised against all
“ persons concerned before the Lords of Session, who
“ are hereby impowered to discuss the relevancy ; and
“ to determine upon the rights and interests of all par-
“ ties concerned, and to value and divide the same,
“ according to the value of the rights and interests of
“ the severall parties concerned ; and to grant commis-
“ sions to Sheriffs, Stewarts, Baillies of Regalitie and
“ their Deputies, or Justices of Peace or others, for
“ perambulating and taking all other necessary proba-
“ tion, which commissions shall be reported to the said
“ Lords, and the said processses ultimately determined
“ by them ; and where mosses shall happen to be in the
“ said commonities, with power to the said Lords to
“ divide the said mosses amongst the severall parties
“ having interest therein in manner aforesaid ; or in
“ case it be instructed to the said Lords, that the said
“ mosses cannot be conveniently divided, His Majesty,
“ with consent aforesaid, statutes and declares, that the
“ said mosses shall remain common, with free ish and
“ entry thereto, whether divided or not ; declaring
“ also, that the interest of the heretors, having right
“ in the said commonities, shall be estimat according to
“ the valuation of their respective lands or properties,
“ and which divisions are appointed to be made of that

“ part

“ part of the commony that is next adjacent to each
 “ heretor’s property.”

From this Act it appears how simple the regulations are, which a century ago were thought sufficient in a part of the kingdom, not distinguished for the scarcity of its wastes; and under the provisions of that Act, many extensive commons have been divided, in a manner that has given satisfaction to the parties interested therein. By this law, it is proper to observe, that a division may be procured at the instance of any one having interest: But the expence of obtaining that division, though instituted at the suit of one, is defrayed by the whole parties concerned, in proportion to their respective shares.

However excellent this law is justly accounted, and however useful it has proved, yet there are two alterations in it, which might render it still more effectual than at present.—The first is, that of taking away the exception ingrossed in the statute, by which no common can be divided in which either the Crown or any Royal Borough is interested. For this exception no good reason can be assigned, and it probably originated from a jealousy which might naturally occur at the formation of a new system, but which the experience of almost a century ought before this time to have totally removed.—The second alteration might be adopted with great advantage from the practice of England. By the Scotch Act, the Court of Session is empowered to grant commissions to Sheriffs, Justices of Peace, or others, for perambulating and taking all other necessary probation, or, in other words, ascertaining the extent of the common, &c. and the result of the investigation is directed to be reported to the Court of Session, to be finally determined on by them. Questions however respecting the rights of parties, &c. are heard before the
 Court

Court of Session alone. Where the common is of great extent, this is attended with great expence and much delay. The number of questions which may arise is more than a court of law, having a great load of other business to go through, can always attend to. It would be infinitely better, therefore, were either the Sheriff of the county, or the Court of Session, to nominate commissioners, not less than three or more than five, who should be intrusted with the same extensive powers which are given to the commissioners in England, when appointed by private Acts of Parliament. They ought not only to have the power of nominating surveyors, &c. but all questions arising in course of the proceeding ought, in the first instance, to be heard before and decided by them. After they have given their award, it may then be brought under the cognizance either of the Sheriff or of the Court of Session with effect; and all parties conceiving themselves injured, may then have an opportunity of complaining, and of having their case fairly considered, more especially if there be any room to suspect either falsehood or corruption in the commissioners. Every one must see how much easier it is to determine any litigated point, after it has been once decided upon, than if it had never received any former judgment. The parties would in many cases probably acquiesce in the decision of the commissioners, and at any rate, the great object would be attained, of having the business effectually done, and the common speedily divided, every delay in which must be attended with considerable loss both to the parties interested and to the public.

It is impossible on this occasion not to remark the very essential benefits which may often be obtained, by comparing the codes of England and Scotland,

and ascertaining the advantages of which they are respectively possessed. It may often happen that the combining the principles of the two codes may be as useful to the laws, as an union of the two Legislatures has proved advantageous to the strength, the security, and the happiness of both kingdoms; and there cannot be a doubt that it would be at least desirable to establish the same system of agricultural legislation and police over the whole Island.

CONCLUSION.

On the Advantages to be derived, both by Individuals and the Public, from the Division and Improvement of the Waste and Commons in the Kingdom.

Whoever has taken the trouble of perusing the preceding observations, will not be surpris'd to find, that in the Reports transmitted to the Board by its different surveyors, the passing of a General Inclosing Bill should be uniformly mentioned, as the first and most essential means of promoting the general improvement of the country; and the importance of that measure, has not as yet, perhaps, been so distinctly stated as it deserves. In general, those who make any observations on the improvement of land, reckon alone on the advantages which the landlord reaps from an increased income; whereas, in a national point of view, it is not the addition to the rent, but to the produce of the country, that is to be taken into consideration. It is for want of attending to this important distinction, that people are so insensible of the wonderful prosperity that must be the certain result of domestic improvement. They look at the rental merely, which, like the hide, is of little

little value, compared to the carcase that was inclosed in it. Besides, the produce is not the only circumstance to be considered—that produce, by the art of the manufacturer, may be made infinitely more valuable than it originally was. For instance: If Great Britain, by improving its wool, either in respect to quantity or quality, could add a million to the rent rolls of the proprietors of the country, that, according to the common ideas upon the subject, is all the advantage that would be derived from the improvement: but that is far from being all—the additional income to the landlord could only arise from at least twice the additional produce to the farmer; consequently, the total value of the wool could not be estimated at less than two millions: and as the manufacturer by his art would treble the value of the raw material, the nation would be ultimately benefited in the amount of six millions *per annum*. It is thus that internal improvements are so infinitely superior, in point of solid profit, to that which foreign commerce produces. In the one case, lists of numerous vessels loaded with foreign commodities, and the splendid accounts transmitted from the custom-house, dazzle and perplex the understanding; whereas, in the other case, the operation goes on slowly but surely. The nation finds itself rich and happy; and too often attributes that wealth and prosperity to foreign commerce and distant possessions, which properly ought to be placed to the account of internal industry and exertion. It is not meant by these observations to go the length that some might contend for; namely, to give any check to foreign commerce, from which so much public benefit is derived, but it surely is desirable, that internal improvement should at least be considered as an object fully as much entitled

to attention as distant speculations, and when they come into competition, evidently to be preferred.

There are some, however, who, although they are ready to acknowledge that the improvement of the soil is the best source of national wealth, yet have formed an idea, that very little of the extensive wastes in the Island are worth the cultivating, who are too apt to imagine that the climate in which they are situated is hostile to improvement; and, were it better, that the nature and quality of the soil are obstacles not to be surmounted.

In regard to the climate of such wastes, it is evidently worse in consequence of the want of cultivation. At the same time, from the insular situation of Great Britain, the climate is infinitely milder and better than in any part of the continent of the same latitude. It is stated in one of the Reports, on the most respectable authority*, that very fine barley and oats ripen in due season, on the summit of a hill in Forfarshire, elevated 700 feet above the level of the sea; and that in Invernesshire, at an elevation of 900 feet above the same level, wheat of a good quality has been grown.—Hence it may be inferred, that grain, and other articles of a similar nature, may be raised to such a height upon the sides and summits of all the hills in the Island; and, in regard to grass, it is well known that luxuriant crops of hay are obtained at the lead hills in Lanarkshire, elevated 1,500 feet above the sea. The climate of this country, therefore, can hardly be urged as an objection to the improvement of the greater part of our wastes, either for grain or grass; as to trees, it is not to be

* See Preliminary Observations to the Report of Forfarshire, by George Dempster, Esq. p. 6.

questioned that the larch grows in Italy on higher mountains than any we have in this Island*.

In regard to the soil, though the greater part of the wastes, having never received any advantage from the labour of man, are at present of little value, yet the portion is not very considerable, that ought to be accounted totally barren and unprofitable, or incapable of yielding some useful and valuable production: 1-22d of the whole, or one million of acres, is certainly an adequate allowance.

This leads me shortly to state the various purposes to which the remainder of such wastes may be appropriated.

1. The higher situated and the most sterile parts, ought undoubtedly to be devoted to plantations,—There is scarcely any spot, however rocky, or any soil, however unproductive, that will not yield valuable timber—an article which at present we are under the necessity of importing, at a great expence, from foreign countries. At first sight it may seem surprising, that a spot that would not produce a single blade of corn, will yet support the stately pine, or the spreading oak. But trees draw their nourishment from sources beyond the reach of smaller vegetable productions, and by their leaves are also supposed to derive additional sustenance from the air that surrounds them, or the water they imbibe. By plantations also, even barren spots may in process of time be rendered fertile. The poorest soils, if covered with wood, from the leaves which fall, and the shelter they receive, improve every year in fertility, and when the trees are ready for the axe, become, in process of time, fit for cultivation.

* See Westmoreland Report, Preliminary Observations, p. 9.

2. Many of the higher wastes in the Island might easily be rendered perfectly dry, and soon converted into excellent upland pasture. There that valuable article, fine cloathing wool, might be grown in perfection. The loftier the situation, and the shorter the herbage, the more valuable it would be; and the price which the article bears, joined to the profit of the carcase on which it grew, would amply compensate for all the expence of the improvement.

3. A much greater proportion of the wastes of this country, than is commonly imagined, might be employed in tillage.—The surface may appear barren and unproductive, but stratum may be found below, which, if incorporated with the soil above, may render it sufficiently fertile. This is a practice in husbandry which has not yet been carried, in any degree, to the extent of which it is capable. It is an art pretty much in its infancy, which when brought to perfection, must be productive of the most important consequences. As such, it will naturally call for the particular attention of the Board of Agriculture, to ascertain the principles on which it can best be conducted*.

4. A considerable proportion of the wastes of Great Britain, consists of land of a wet and boggy nature, which it has been yet supposed was the most difficult to improve and cultivate. Fortunately, however, discoveries have been made in the art of draining such bogs, by Mr. Joseph Elkington, a farmer of the county of Warwick, as renders the improvement of swampy land a matter of much less difficulty or expence than formerly. It is only necessary to add under this head,

* Mr. Kirwan, in his Treatise on Manures, to be found in the Irish Philosophical Transactions, Vol. V. has thrown much light on this important subject.

that Mr. Elkington has communicated his system of draining to those Members of the Board who were appointed to meet with him upon the subject,—that he has undertaken to teach such persons as may be appointed by the Board for that purpose ; and that there is reason to imagine that the practice of his useful art will be extended, in the course of the ensuing summer, from one end of the Island to the other. Bogs drained on Mr. Elkington's principles soon become of very great value as meadows, and in many cases may be converted into arable land.

Lastly, at least a million of acres of the waste lands in the kingdom may certainly be brought to an astonishing height of produce by watering or irrigation. This great means of improvement, though long established in some parts of the kingdom, yet in others has been unaccountably neglected. But when once that art is extended as it deserves, the advantages thence to be derived cannot easily be calculated,—for by it land is not only rendered perpetually fertile without manure, but the luxuriant crops which it raises, produces manure for enriching other fields ; and the manure obtained from that produce, is another source of national wealth that could not otherwise be looked for.

Thus there is every reason to believe, that the wastes of this kingdom, if planted—or appropriated for pasture lands—or cultivated for the production of grain—or converted into meadow—or improved by means of irrigation, must necessarily be the source of infinite wealth and benefit to this country.

And if there is a possibility of improving our wastes, the means for that purpose are more abundantly in our power than perhaps in that of any other country in the universe. Without entering much at length into so

wide a field, it may be sufficient to remark, that there is none with such a capital capable of being devoted to so useful and profitable an object ;—none where such a spirit of exertion exists, were all obstacles to the improvement of our wastes removed ;—none where there is such a mass of knowledge on agricultural subjects ;—none where such abundance of manures are to be found, particularly those of a fossil and mineral nature, without the aid of which it would be impossible to bring great quantities of waste lands rapidly into cultivation ;—and, lastly, none, where by means of a series of excellent roads, and canals every where rapidly extending, such manures can be so easily and cheaply conveyed to the lands they are calculated to fertilize. These are advantages for improving wastes which no other country enjoys in equal perfection, and which would soon be the means of cultivating a very large proportion indeed of our at present useless territory, if full scope were given to the industry and exertions of the people. Nor ought the wealth to be derived from the improvement of our wastes to be alone taken into consideration. The increase of population, and above all, of that description of persons who are justly acknowledged to be the most valuable subjects that any government can boast of, merits to be particularly mentioned. His mind must indeed be callous, who feels himself uninterested in measures by which not only the barren waste is made to smile, but of which the object is, to fill the desert with a hardy, laborious, and respectable race of inhabitants, the real strength of a country ; being the fruitful nursery, not only of our husbandmen, but also of the fleets, the armies, and the artists of the nation. The additional number of inhabitants who might thus receive occupation and subsistence, cannot easily be ascertained ; but

if

if the present population of Great Britain amounts to about ten or twelve millions, these wastes and commons, properly improved, might be the means of adding, at least, from two to three millions;—a number, it may be proper to observe, equal to that possessed by the United States of America, when they first erected the standard of independence against the Mother Country. The evils were then felt from the creation of such an extent of population at a distance: but from such an increase of people at home, instead of similar consequences being to be apprehended, additional strength and prosperity of every description may be looked for with certainty.

There is another point of view in which this subject ought also to be considered.—The improvement of wastes not only adds to the wealth and population of a state, but also renders it more defensible. An inclosed country is, perhaps, the strongest of any. Every hedge and ditch becomes a rampart, through which an enemy cannot easily penetrate, and which there is little difficulty in defending. Were this kingdom completely inclosed, and no opportunity afforded of fighting any pitched battle (the only thing to be dreaded in the event of an invasion), we should have little reason to apprehend the landing of any body of men, however numerous, or however well disciplined. They might do some mischief on the coast, but could never penetrate into the interior of an inclosed country. The best defence the capital can have, is not to suffer a spot of uninclosed ground to remain between it and the coasts in its neighbourhood.

Before concluding this Address, it is necessary to take notice of one important circumstance. For some years past, this kingdom has been under the necessity of im-

porting grain from other countries; and the importation seeming to increase rather than otherwise, it was seriously apprehended that the agriculture of this Island could not furnish grain sufficient for the use of its inhabitants. Many reasons may be assigned for the scarcity of grain; the seasons since 1754 have certainly been in general unfavourable. We have seldom had two successive good seasons, but often two successive bad ones. To this natural cause may be added the increased population, consumption, and luxury of the people, and the greater attention that of late has been paid to the improvement of stock, in consequence of which considerable tracts of arable land have been converted into pasture. This, instead of being a public loss, was undoubtedly a national benefit. Land that for ages had been kept in tillage, and produced but scanty crops of grain, required rest, and was usefully appropriated for pasture.—But to complete the policy of this system, at the same time that arable land was converted into pasture, pasture land ought to have been rendered arable, and every acre of waste land fit for that purpose, that had remained untilled, perhaps since the creation, would have soon repaid the labours of the husbandman, by whom it was brought into culture.

Nor is the quantity of land, the cultivation of which would prevent the necessity of importing foreign grain, so considerable as is commonly imagined. The importation from foreign countries, for eighteen years, ending 5th January 1789, amounted only to 767,841 quarters of wheat, and 5,097,166 quarters of oats, rye, beans, &c. which is at the rate of 42,657 quarters of wheat, and 283,175 quarters of oats, &c. *per annum*.—The extent of ground which it would require to raise that quantity of grain, cannot be calculated at more than

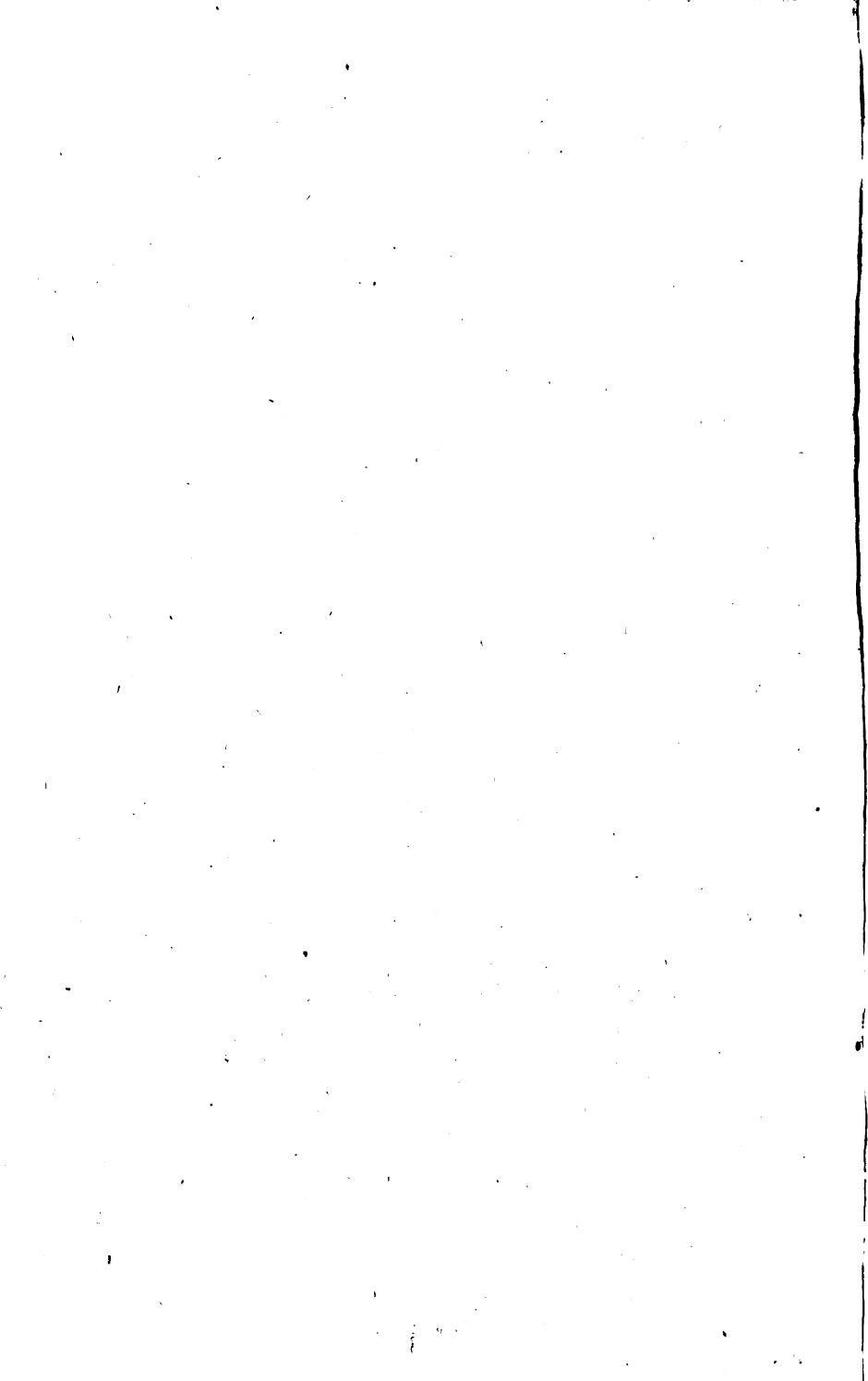
than 100,000 acres *. Let us then only convert that quantity of land from pasture into tillage, or indeed devote only $\frac{1}{100}$ th part of our waste lands for that purpose, and the business, in so far as respects the existing population in the kingdôm, is effected.

When it is considered the high prices which grain and other articles of provision bear at present, which have been rather increasing than otherwise for some years past, and the consequences which might arise, were these articles to become still scarcer and more expensive, it surely cannot require any additional arguments to prove the necessity of not losing an instant in taking such measures as may be thought most advisable, for the purpose of acquiring from extensive tracts, situated in the very bosom of our country, the certain means of national subsistence and prosperity.

* The ground necessary to produce this quantity of grain may thus be calculated :

	Acres.
42,657 of wheat, at the rate of 3 quarters per acre, would require - - - - -	14,219
283,175 of oats, rye, beans, and peas, at 4 quarters per acre, would require - - - - -	70,793
Total acres -	85,012

It may be said, that no allowance is made for feed or fallow. Admitting that 15,000 acres more may be required on that account, the whole cannot be stated at more than 100,000 acres. It is to be observed, however, that the quantity of grain imported has astonishingly increased since 1795.



ESSAY VI

SUBSTANCE OF A SPEECH

IN A COMMITTEE OF THE WHOLE HOUSE,

ON THE

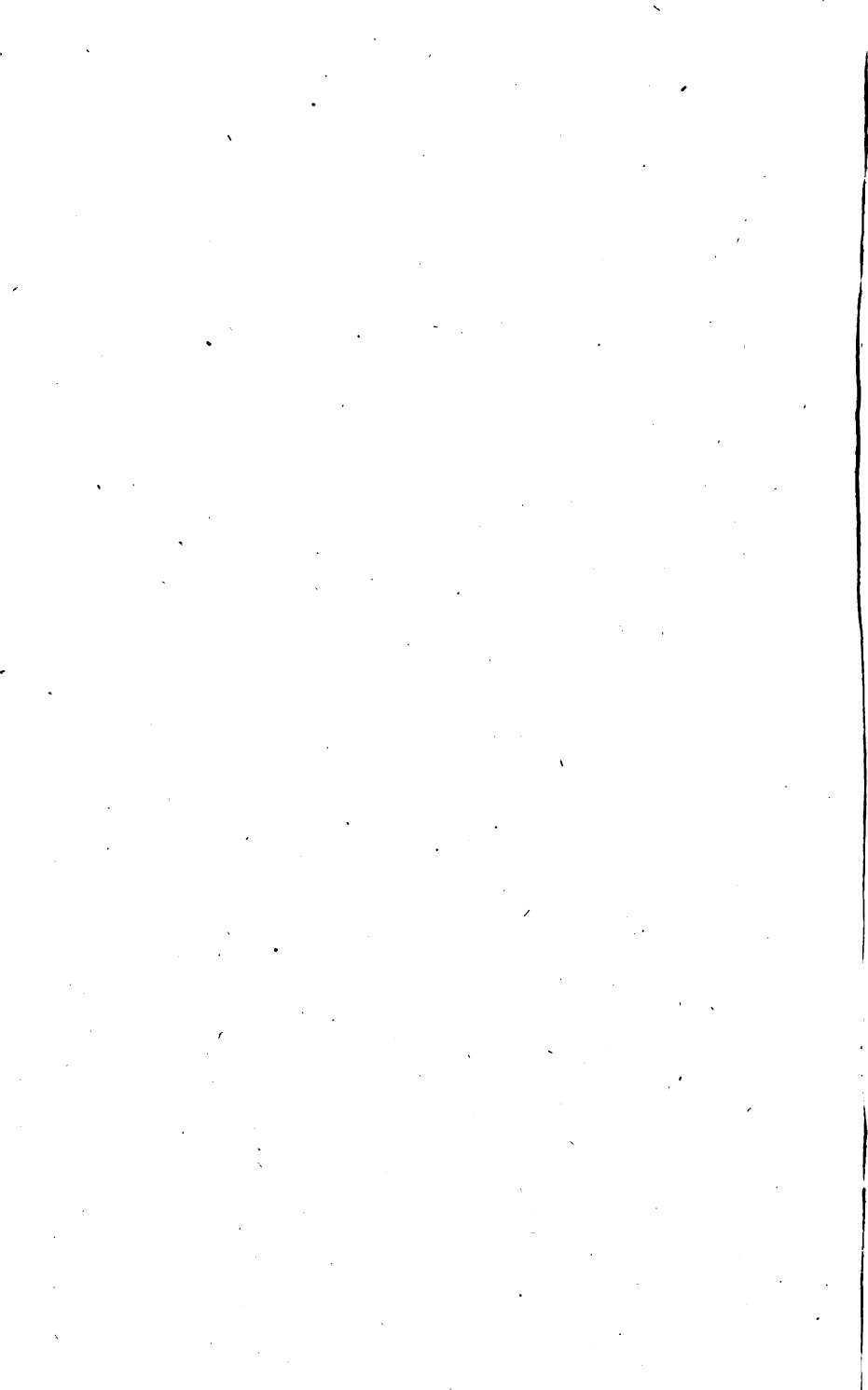
MEANS OF IMPROVING THE SYSTEM

OF

PRIVATE BILLS OF INCLOSURE,

AND THE

**RESOLUTIONS OF THE SELECT COMMITTEE UPON THAT
SUBJECT.**



ADVERTISEMENT.

AFTER various attempts to carry a General Bill of Inclosure through Parliament, I was at last obliged to relinquish that idea ; though there does not seem to me any solid objection to the acts which were brought in, more especially to one, which, after having passed the House of Commons, was thrown out in the Lords. I found it necessary, therefore, to alter the plan, and instead of persevering in attempting to introduce a new system, to endeavour to improve the old. With that view I proposed the appointment of a Select Committee, to examine the nature and origin of private Bills of Inclosure, and the proceedings held under them. The result was the adoption of the following Resolutions by both Houses. They were afterwards carried into effect by an Act, which has already tended much to diminish the expence of Private Bills, and if the provisions of that Act were still farther extended, the expence attending inclosures, under the authority of Parliament, would become extremely moderate, and, indeed, could hardly be complained of.

**RESOLUTIONS of the HOUSE OF COMMONS, regarding
*Bills of Inclosure.***

I. THAT in order to promote the cultivation and improvement of the waste, uninclosed, and unproductive lands, commons, common arable fields, meadows, and common of pasture in this kingdom, it may be expedient to adopt such regulations as would diminish the expence of inclosing and improving the same, under the authority of Parliament.

II. THAT in order to diminish the expence of Bills of Inclosure, it may be expedient that regulations should be adopted by the two Houses of Parliament, for the admission of affidavits, authenticated by the certificate of one or more magistrates, as sufficient evidence of the notices, the consents, and the allegations in the preamble of such Bills, instead of the parole evidence now required: unless where the latter should appear at the time to be necessary from particular circumstances.

III. THAT, for the same purpose, it may be expedient that a general law should be passed, comprising all such provisions as by experience have been found necessary in most Bills of Inclosure: to which all such Bills in future might refer.

IV. THAT, in order to diminish other expences incidental to Bills of Inclosure, it may be expedient that provision should be made in such general law, for taxing the charges of the Solicitor; regulating the conduct of the commissioners; and preventing any unnecessary delay in carrying such Bills into effect.

V. THAT in the case of small inclosures, not exceeding 300 acres, it may be expedient to provide, that such Bills should be considered, as to the payment of fees, only as single Bills; and that those for the inclosure of smaller tracts of land, not exceeding one hundred acres, should be subject only to the payment of half the fees due on a single Bill: The admeasurement in both cases to be proved in the same manner as is proposed by the second Resolution regarding Notices and Consents.

ESSAY VII.

SUBSTANCE OF A SPEECH IN A COMMITTEE OF THE WHOLE HOUSE,

ON THE

Means of Improving the System of Private BILLS of
INCLOSURE, and the RESOLUTIONS of the SELECT
COMMITTEE upon that Subject.

SIR,

THOUGH the subject of Inclosure has frequently been discussed within the walls of this House, and having long been a general topic of conversation and of inquiry, must necessarily be familiar to the mind of every gentleman to whom I have now the honour of addressing myself; yet, as it is a question of such infinite moment to the most important interests of the country, and now comes in somewhat of a new shape, and, I trust, under better auspices, I hope that the Committee will have the goodness to excuse me for troubling them with some general observations upon it; and, in particular, for explaining the grounds on which I have taken the liberty of moving the specific resolutions on the table.

Some years have now elapsed since I first was led to call the attention of the House to the means of promoting the general improvement of the country. I felt, in common with every individual who has thought upon that subject, no small degree of astonishment and of regret, that a nation, like this, possessed of a territory naturally disposed to fertility, and living in a climate capable

capable of producing every real necessary of life, should be so frequently under the disgraceful necessity (for I can speak of it in no softer terms,) of depending on foreign industry, and relying on distant cultivation, for the means of its subsistence. I was thence led to recommend two measures to the attention of the House. The first was to ascertain, by minute and extensive inquiries, the best means of cultivating the soil, and establishing, over the whole kingdom, a judicious system of husbandry. The second, and undoubtedly the most important of the two, was to discover the obstacles to improvement, more especially those of a legal nature, which it might be in the power of Parliament to remove; for it was in vain that the means of improving the wastes, the commons, and other unproductive lands of the country could be pointed out, if by the laws, as they now stand, no person is entitled to cultivate them; and if they are doomed, except through the medium of a troublesome and expensive series of proceedings, to remain in their present state of sterility.

With a view of removing so great an obstacle to improvement, and fortified in my own opinion by the instructions of a respectable institution, (I mean the Board of Agriculture) I took the liberty, some years ago, of suggesting to the House a measure, known under the name of The General Bill of Inclosure. I am far from thinking such a law impracticable. On the contrary, indeed, I have no hesitation in asserting, that it is possible to frame an Act which might not, perhaps, be calculated for every individual case, but which would be sufficient for a very large proportion of the number.

Finding, however, innumerable difficulties in accomplishing such an object, and trusting that it will yet be

taken up by some other individual who may have better claims to command the attention of the House, and happier prospects of success in so important an undertaking, I have been under the necessity, however reluctantly, of relinquishing the pursuit.

In the course of the attempt to form a General Bill of Inclosure, I found it necessary to peruse a great number of private Acts for the purpose of more fully comprehending the subject, and having also had an opportunity of discussing a variety of questions connected with inclosure, with a number of intelligent and respectable persons from all parts of the kingdom, it seemed to me a matter hardly to be questioned, that the present system was capable of great improvement, and that it might be productive of much benefit to the public, if the regulations calculated for that purpose were passed into a law. I was thence led to move for the appointment of a Select Committee, to take the subject into its consideration. A number of respectable Members were appointed for that purpose, and a minute and extensive inquiry having been undertaken, the result of the whole investigation was reported to the House, and is now, together with certain Resolutions founded thereon, referred to the consideration of this Committee.

As that Report has been printed for some days, and, I understand, has been called for with peculiar avidity, I hope that every Member here present has had an opportunity of perusing it, and consequently that it is unnecessary for me to take up the time of the Committee, in going through the various particulars therein detailed. It may be proper, however, in general, to remark, that it consists of two parts. The first explains the progress of a Bill of Inclosure, according to the present

present system ; the second, the improvements of which that system is capable.

In regard to the first point, the Committee have gone through the whole progress of a Bill from its commencement until it has been completely carried into effect ; for the particulars of which, I beg to refer to the Report itself. It appears, however, from the detail therein contained, that so many difficulties stand in the way of such applications, that it must be matter of astonishment to every one, how so many Acts as are to be found in the statute book, have been applied for. It displays such a surplus of capital, such a zeal for improvement, and so much real anxiety to render the country fertile and productive, that we may easily suppose what will be the effect of giving such a spirit any additional impulse and encouragement.

But the point which, I trust, has attracted the peculiar attention of the Committee, is the means of improving the present system. It is impossible to read that Report without being satisfied that the trouble and expence attending applications to parliament may, in various respects, be materially diminished ; for that observation is not to be confined to one or two points, it fortunately extends to every stage of the proceeding ; from the first meeting to consider the propriety of making the application, until the final award of the Commissioners. Hence it may be expected that a saving, on the whole, will arise, beyond the most sanguine expectations of those who may be anxious to promote that species of improvement.

Having stated these general observations on the subject of the Report, I shall now proceed to consider the specific resolutions which have been referred to this Committee.

The first resolution states the general expediency of diminishing the expence of inclosing and improving the waste and other unproductive lands of the kingdom.

I do not intend, at present, to dwell on the policy of encouraging inclosure, though it may not be improper to make a single observation on one point, namely, an assertion in the course of a late examination at the bar of another Committee, on the subject of the Union with Ireland, that inclosures tended to decrease the quantity of what is called clothing wool, or at least to deteriorate its quality. But as the weight of the fleece is unquestionably augmented by better pasture; and, at any rate, as the quantity of mutton, of beef, of grain, or of some other agricultural production, must thereby be necessarily increased, I am persuaded that the Committee will see no necessity either for throwing open old inclosures, or encouraging new ones, and preventing all the improvements of various descriptions connected therewith. Indeed I have the satisfaction of adding, that the alarms of the manufacturers on this head, are, in a great measure, groundless; for it is found by the experience of a celebrated breeder, (I mean Mr. Ellman, of Glynd, in Suffex,) that the fine clothing wool they so much wish for, may be obtained from sheep of the proper breed, though constantly kept on what is called artificial food. The mountains of Scotland also, will soon become another source of supply, being every year more and more appropriated to the feeding of sheep instead of cattle; a change of system so likely to be of infinite service to the general interests of the nation, that I have thought it incumbent upon me to promote it as much as possible.

The second resolution relates to the necessity of proving, by parole evidence, before both Houses, the
notices

notices and consents, and the allegations in the preamble to the Bill.

It is hardly necessary to make any addition to the observations contained in the Report on that subject. In cases of opposition and difficulty, parole evidence may be necessary to ascertain the truth of any point that may be disputed; but where there is no dispute, where all the parties interested approve of the measure; where there is not a question about it, why they should be put to an enormous expence in proving by parole, instead of written testimony, need not be dwelt upon. At present, in order to prove facts, not to be controverted, witnesses must be brought to London from any county, however remote, the expence of their journey must be paid, they may be detained in this expensive metropolis at the charge of the parties, perhaps three weeks, and sometimes three months, (for that depends on the progress of the Bill and the opposition it meets with,) and then their expences home again must be defrayed. Such a system seems to me contrary to the soundest principles of policy, and the grounds of that opinion I shall briefly endeavour to explain. Whenever an inclosure is determined on, a portion of the capital of the country is devoted to the most important of all purposes, namely, that of permanent improvement, yielding annually those productions which are most essential to the interests of the public. Unnecessary expences, therefore, which diminish a fund thus so usefully appropriated, or prevent, from the terror of unnecessary expence, the national capital from receiving that direction, cannot be too loudly reprobated, or guarded against with too much care. Hence arises the policy of supporting the proposed alteration, nor should such a system be restricted to Inclosure Bills alone. Were it extended

tended to other private Acts, as Estate Bills, Turnpike Bills, and the like, it can hardly be doubted that it would be productive of infinite benefit to individuals, without any possible detriment to the public. Indeed, when the Union with Ireland takes place, some such regulation will become absolutely necessary; but having every reason to hope that the Resolution as it now stands, is very generally approved of, it would be ill judged to clog it with any addition, however desirable, that might be the means of rendering the whole measure abortive.

The third Resolution states the expediency of comprehending in one general law, such regulations as have been found necessary in almost all Bills of Inclosure.

On examining the various Bills presented to Parliament, it appeared that there is a number of clauses, either required by the orders of the House, or necessary in such Acts, which are copied from one Bill into another, and uniformly repeated almost all in the same words. This occasions, in many cases, a great and useless expence; 1. in preparing a draft of the Bill; 2. in copying it; 3. in printing it; and, 4. in the ingrossment on parchment, for the purpose of its being preserved in the Records of Parliament. Whereas, if a general law were passed for the purpose merely of ascertaining the powers of commissioners, and regulating the forms of their proceedings, it cannot be questioned, that the length, and consequently the expence of private Acts, for the inclosure of any particular district, might be considerably reduced; indeed to an extent beyond what Gentlemen are aware of. It is certain that there are local circumstances in many parishes, which may render special clauses necessary, and the

rights of lords of manors, and also of tithe owners, are so extremely various, that it may be expedient to leave them to be regulated by each particular Act. But the other clauses in Bills of Inclosure need not be inserted in private Acts, if a general law existed, containing such regulations as in their nature must be applicable to all such Bills. Besides, Bills of Inclosure, when originally brought into the House, were far from being distinguished by such prolixity. The first upon record, namely, that for the inclosure of Ropley commons, in the county of Southampton, (8 Anne, cap. 20.) was printed in one page, though it contained two different objects. It is certain, that several clauses were omitted in it, the necessity of which farther experience has pointed out. It exhibits, at the same time, a standard to which, in so far as circumstances will admit of it, future Bills ought to be reduced.

The fourth Resolution relates to the principal persons employed under, or connected with Bills of Inclosure, namely, the Solicitor and the commissioners.

In regard to the Solicitor, his charges certainly are a general subject of complaint, though when the question is fairly investigated, perhaps with less reason than is commonly supposed, the magnitude of such charges arising from the number of parties interested, from the complicated state of their property, from regulations which Solicitors are bound to follow, and from circumstances which they cannot controul. At the same time, as there is no uniformity in their mode of charging, nor any check on their making almost any demand, however exorbitant, it is certainly desirable to include, in any general law that may be passed upon the subject, some mode of taxing their bills, as is usual in similar cases.

As to the commissioners, it cannot be doubted that many persons, of very respectable characters, have acted in that situation; and, indeed, no one is fit to be appointed to that office who is not a man conversant in business, and who does not possess a competent knowledge of various branches connected with rural economy. Persons of that description are certainly entitled to an ample recompence for their labour; nor is the sum usually allowed (about two guineas per day, the commissioner paying his own expences,) at all unreasonable, provided the whole day were dedicated to one particular inclosure. But it is stated in evidence to the Committee, that it is not unusual for commissioners to undertake the business of more than one inclosure in the same day, requiring the same allowance from different parties; that a charge is frequently made, and a meeting held, when little or no business is done; and, indeed, that they sometimes make a charge when they have not attended at all, though they may afterwards sign the minutes of the proceedings.

It is well known that commissioners under a Bill of Inclosure, are necessarily entrusted with great and extraordinary powers; without which, indeed, it would be impossible for them to carry into effect the important object for which they are appointed. The business they are directed to execute is, in general, of no common magnitude. They are entrusted with the power of dividing among a number of persons, property of great value and extent, in some instances worth from 100,000*l.* to 500,000*l.* or even 600,000*l.*; and much depends not only upon giving to each individual, in regard both to quantity and quality, his fair proportion, but also in making it as convenient and contiguous as possible to the rest of his estates. On the whole, it is

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fair to suppose, that the generality of commissioners execute the trust they undertake to the satisfaction of the parties interested, otherwise, it is hardly to be credited, that inclosures would have gone on in the manner they have done. At the same time, as abuses must creep into every system, unless narrowly watched, and as several instances of misconduct have been stated to the Select Committee, hence, if a general law were to pass regarding Bills of Inclosure, it certainly would be expedient, to enact such regulations as respectable commissioners would be desirous of observing, and as those of a different description would not venture to infringe.

I now, Sir, come to the last Resolution, namely, that which relates to fees on Bills of Inclosure in the two Houses, and by which the propriety of diminishing the fees on small inclosures is particularly recommended.

On the subject of fees, I trust, that the information contained in the Report will be perfectly satisfactory both to the House and to the public. It appears from the evidence therein given, that the fees on Bills of Inclosure in both Houses do not exceed, on the average of 14 years, from 8000*l.* to 9000*l.* per annum, and consequently cannot be accounted an object of any material importance. The Committee have thought it expedient to recommend the reduction of fees on small inclosures only, which, there is every reason to believe, would so much increase in number from that encouragement, that smaller fees would produce more money to the officers of the two Houses. If that should not be the case, it would be proper to recur to the precedent adopted in circumstances exactly similar, namely, on the 12th April 1709, when “ the House having taken
“ into its consideration the great losses which have al-
“ ready,

“ ready, and will hereafter arise to the Clerk and other
 “ officers of the House, from the General Naturaliza-
 “ tion Bill, and from the late orders made concerning
 “ the passing of private Bills through the House,” ad-
 dressed the Queen to give them some recompence and
 encouragement; which her Majesty, in her answer
 of the 20th April, promised should be attended to. On
 the subject of such indemnification, it is hardly possible
 that any difference of opinion can be entertained. No
 one can suppose that the vast variety of business con-
 nected with the legislation of so extensive an Empire,
 can be carried on without considerable expence; nor
 can it be doubted, that public officers are justly entitled
 to incomes adequate to the situations which they hold,
 and to the important charges with which they are en-
 trusted. If therefore, for the purpose of any internal
 regulations, their incomes are diminished in one way,
 they must, as a matter of course, be made up by some
 other means adequate for that purpose. How far it
 may be proper, or necessary, to come to any specific
 resolution at present regarding such indemnification, in
 case those officers should suffer any injury from the re-
 gulations in question, I must submit to the consideration
 of the Committee at large, and in particular of the
 Right Honourable Gentleman who presides in that
 Chair, with so much credit to himself, and so much ad-
 vantage to his country.

On the subject of that indemnification, it is only ne-
 cessary to add, that were it to occasion some expence to
 the public, yet such are the advantages, in a pecuniary
 point of view, which the Exchequer derives, either di-
 rectly or indirectly, from Bills of Inclosure, in con-
 sequence of the stamps they require, the consump-
 tion of various articles, and the travelling they occasion;

and now from the additional income they give rise to, that any charge of that nature ought properly to be considered in the light not of a bounty, but of a drawback; repaying to the spirited improver of the waste and unproductive territory of the country, those sums, which his exertions, through various channels, put into the coffers of the community.

I have thus, Sir, shortly touched on the principal topics connected with the Report of the Select Committee, and explained the grounds of the several Resolutions referred to our consideration. I cannot, however, conclude, without briefly stating the circumstances which have induced me to persevere in endeavouring to accomplish an object, with which, in a personal point of view, I have no immediate connexion; but I have long been convinced of the importance of promoting, by every possible means, the improvement and cultivation of the country, (of which a division, allotment, and inclosure of all property possessed in common, must be the basis,) and, indeed, that an increase of inclosure was almost essential for the very existence of the nation.

In the first place, it is impossible that any land can be improved, if it continues either in a state of commonage, or remains uninclosed, and is consequently open to the inroads of all the neighbourhood. When inclosures are small, they certainly are not so well calculated for the production of grain; but then from the shelter they afford, they are infinitely more favourable for the feeding of stock; indeed, the most careless observer must have remarked the difference, between those full-fed and pampered animals, who swell in bulk almost every day, from the advantages of sheltered and luxurious pasture, when compared to those miserable

and half-starved creatures, who are exposed to every storm, alarmed at the sight of every passenger, liable to eat unwholesome provisions, and thousands of whom perish every year, from the various diseases to which they are subject from hunger and neglect.

In the second place, the scarcity and high price of every species of food, is a strong argument in favour of inclosure. Were the high price of provisions confined to one sort, it might be contended that an increased cultivation would be less necessary. But as every production of the earth, whether arising from arable or pasture land, is equally scarce and dear, it proves, that an additional quantity of improved land is essential to the public interest. Indeed, in a country like this, increasing every year both in population and wealth, nothing but abundance can keep the price of provisions within reasonable bounds. Successful commerce, increasing wealth, and augmenting population, must otherwise make the price enormous; and all these causes operating in conjunction, more especially when combined with an unfavourable harvest, occasion what might be called a famine, not only from the scarcity of the produce, but from the magnitude of the price. It is hardly necessary to remark, how much this must affect all ranks in the community, more especially the middling and lower orders of society. They adjust their living to a particular standard, or, in other words, estimate their expence on the idea that the price of provisions will be at a certain average rate; but if that is altered to any great extent, the whole system of a large body of the community is deranged. One set of men must have their wages increased, in order to be enabled to live; another set must diminish their expenditure, not living on daily wages, and having no means of in-

creasing their income; and a third set are oppressed with heavy burdens, in order to maintain those who are rendered incapable, from the high price of provisions, to maintain themselves and their families. These mischiefs can only be prevented by improving, in regard both to produce and extent, our agricultural productions, and the soil on which they are cultivated.

And here, Sir, I beg leave to state, what seems to me the true policy to be kept in view in regard to the price of provisions, namely, that they should be kept as much as possible at a just, at a reasonable, and at a steady price; at *a just price*, because the farmer must be rewarded for his exertions in cultivating the soil; at *a reasonable price*, because the labourer must be enabled to maintain himself and his family by the profits of his labour; and at *as steady a price as possible*, because otherwise no one, especially such as are possessed of moderate and inferior incomes, can make their income and their expenditure to tally. I have no hesitation in asserting, that as soon as the nation will direct its attention to the internal improvement of its own soil, and will rely for its subsistence on the farmer at home, instead of depending on foreign supply, the principles of policy I have now ventured to recommend, may be completely realized.

In the third place, by cultivating our waste and other unproductive lands, we shall become independent of foreign nations, and will not be reduced to the necessity of negotiating with them for the subsistence of our own people. Let us suppose that there is a scarcity in this country, and that corn could only be had in considerable quantities in Russia, in Prussia, or in France. Would it be no disadvantage in our political intercourse with any of those countries, to be under the necessity of negotiating

negotiating with them for the liberty of exporting provisions. It is well known, that we obtained better terms at the Treaty of Aix-la-Chapelle than otherwise would have been granted, because there was a great quantity of grain in this country, and a scarcity in France.

In the fourth place, when provisions are abundant, no food is consumed that is not fit for the nourishment of man; whereas, if they are scarce, articles of a different description, either raised at home or imported from abroad, must be had recourse to. The consequence of living on unwholesome articles, is surely unnecessary to dwell upon. Various disorders may be occasioned by it; the health of the people is affected, and even those who are born in the course of the succeeding year, have not the usual strength and vigour of their countrymen.

In the next place, the expence of carrying on a war, and the prospect of success in it, may greatly depend, 1st, on the high price, and 2dly, on the wholesomeness of provisions. We certainly have experienced, in the course of the present war, the inevitable consequence of the first point I have alluded to, as hence arose the absolute necessity of increasing the pay of our soldiers and sailors; of contracting at higher rates for supplying our fleets and armies; not omitting the additional allowances which have been necessarily made to innkeepers, notwithstanding which, many of them have been under the necessity of giving up their profession.

In the sixth place, where provisions are scarce, and importation of grain takes place, the balance of trade must be affected thereby, which must be attended with public discredit, and with great loss. If the balance is greatly in our favour, it is not so much felt by the merchant; but if that balance wavers, or is at all unfavourable,

able, and if we must import grain as a matter of necessity and not of choice, it is hardly to be estimated under what disadvantages we might be obliged to carry on our commerce. The consequence necessarily would be, that we must buy dear and sell cheap; specie would be sent out of the country, and we must suffer all the inconveniencies of a cramped circulation.

In the seventh place, a scarcity of corn materially affects the revenue. When that takes place, grain cannot be used without hazard in the distillery, nor in other articles, by which a considerable loss of income may be sustained; and if it should become still scarcer, the duties on malt, and on the brewery, which produce so many millions per annum, might also be affected. And though no prohibition has taken place in consequence of the present scarcity, I question much, whether the income from the brewery will be so productive this year, as in former times of plenty.

In the eighth place, all nations have a certain income to live upon; let us call it in this country 150,000,000*l.* including the income of all ranks of society. If the people here spend 75,000,000*l.* in providing themselves with the necessaries of life, 75,000,000*l.* more remains for purchasing what may be called superfluities, and for paying the demands of the exchequer; but, if instead of 75,000,000*l.* they are obliged to pay 100,000,000*l.* for the necessaries of life, it is evident that they cannot afford themselves so much for providing luxurious gratifications, or supplying the revenue; and they must either become dissatisfied with their situation, (wanting the pleasures they have been accustomed to enjoy,) or the Exchequer must be impoverished.

Lastly, at the conclusion of the present war, every possible inducement will be held forth by foreign governments

vernments, to prevail on the subjects of Great Britain to emigrate to other countries, and to settle there. Unless, therefore, provisions are to be had at a cheaper rate, unless a greater extent of country is improved and cultivated, unless, indeed, more land is rendered purchasable, (and commons, in their present undivided state, cannot properly be accounted a saleable article,) so that a larger proportion of the people of this country may be tied to their native home, not only by early attachments, by language, by religion, by the blessings of a free constitution, and by the protection of equal laws, but also by that species of *anchorage*, if I may be allowed the expression, which naturally results from the enjoyment of fixed property in land, or even the occupation or improvement of it: if that should not be the case, (and for that purpose, I wish no time should be lost in promoting the division of that species of property, which now lies in a manner dormant, that it may become a marketable article) persons may be tempted by the insidious efforts of rival nations to abandon their native country, and to purchase property elsewhere. And were they even to expend their capital in the cultivation of our settlements in the West Indies, or in America, yet still I flatter myself, that the House will agree with me in opinion, that the wealth they were possessed of had much better be expended in domestic improvements.

By cultivating our waste and unproductive lands, however, what a noble prospect presents itself to our view. We secure plenty; we lay the foundation of an increased population, and of the best description; we become, in so far as regards a supply of food, independent of foreign nations; we can carry on wars to greater advantage; we can never be reduced to the necessity of making

making a disgraceful peace; the balance of commerce, once established in our favour, would never be deranged by the extensive importation of so essential an article as grain; our revenue, depending so much on the production of the soil, would not only be steady, but increasing; we should enjoy all the advantages of a most unbounded public credit; and the pecuniary capital of the country would be laid out at home, where its returns would be so ample and so important, instead of being sent abroad to the aggrandizement of rival nations, or expended even in our own colonies, where the returns will necessarily be infinitely less, and much more precarious.

In the course of various communications which I have received in the interesting topic of agricultural improvement, I recollect one transmitted by a gentleman in Cornwall, which struck me with peculiar force, and which I must take the liberty of shortly alluding to before I sit down. It described an exhausted peasant, looking with hungry anxiety, and with gloomy indignation, at the barren waste, on the borders of which his humble cottage was situated. Can there be a more affecting scene than the parent of a numerous and famished family, placed in that afflicting situation, looking with hungry anxiety at the barren waste; enraged to see that soil covered with all the rubbish and beggary of nature, which, if cultivated, would produce the richest crops and the most abundant harvests; enraged to see the skulking rabbit starved, where the industry of man, once unshackled, would soon enable the stately bullock to fatten itself in luxuriant pastures; enraged to see goss and ling, and furze and heath, and all the miserable trash that might be enumerated on such an occasion; to see them growing, where the knotted oak, the pride

of the British forest, would expand its lusty branches, enliven the bleak scene, and, in future ages, would become the boast and bulwark of the country. Permit me, Sir, then to ask, can the House better employ its time, or more usefully exercise its wisdom, than in the glorious attempt of completing the contract which I have thus endeavoured to depict? Were it to engage in that great undertaking, what invaluable advantages might not be expected from it. With what anxiety would I not feel to publish tidings which would cheer the heart of every individual who heard them. Would to God, Sir, that, on such an occasion, my voice could extend from one extremity of this Island to the other; that it could be heard in the inmost recesses of those caverns in Cornwall, where the industrious miner explores the hidden riches of the earth, and thence to the summits of those lofty mountains, where the hardy Highlander roams after his scattered herds, views his still dreary wastes, and surveys a tumultuous and a boundless ocean. With what pleasure would I not announce to them, that by the wise measures which Parliament had resolved to adopt, the first of blessings, namely, an abundant quantity of food, had been secured; that scarcity would never again be heard of; nor would famine dare to erect her horrid aspect within the boundaries of these kingdoms; on the contrary, that the distresses which we now unfortunately experience, would soon give way to future seasons of abundance.

Permit me to add but one or two observations, before I bring, what I have to say upon this interesting topic, to a conclusion.

We have begun, it is well known, another campaign against the foreign enemy of the country, and, I rejoice to find, with every rational prospect of success. Why should

should we not attempt a campaign also, against the greatest domestic foe this country has, I mean the hitherto unconquered sterility of so large a proportion of the surface of the kingdom? Let us try the effect of internal as well as of foreign conquests. Let us not be satisfied with the liberation of Egypt, or the subjugation of Malta; but let us subdue Finchley Common; let us conquer Hounslow Heath; let us compel Epping Forest to submit to the yoke of improvement. These are conquests which will add to the strength and substantial energies of the nation; and, by them, we shall be enabled to preserve those distant acquisitions, more splendid it is true, though infinitely less substantial, than internal improvements; but which, as a proof of valour, of enterprize, and of exertion, a great and spirited nation is naturally anxious to obtain.

The only additional observation with which it is necessary that I should now trouble the Committee, is this. The British Constitution, in its restricted sense, as confined to this Island merely, is drawing to a close; its political existence, independent of its connection with Ireland, is only to last a few months longer. Let us then make the better use of the time we have; let us strain every nerve to leave an honourable reputation behind us; and, above all, let us resolve to lay the foundation of a general system of improvement, before the Representatives of another nation can partake in the glory to be derived from it. Establishing that foundation, at this time, will be an eternal monument of our zeal for promoting the interests of those whom we represent, and of our anxiety to confirm the future strength and happiness of our country.

On these grounds, I take the liberty of moving,

[See the first Resolution, annexed to the Advertisement.]

ESSAY VIII.

H I N T S

REGARDING

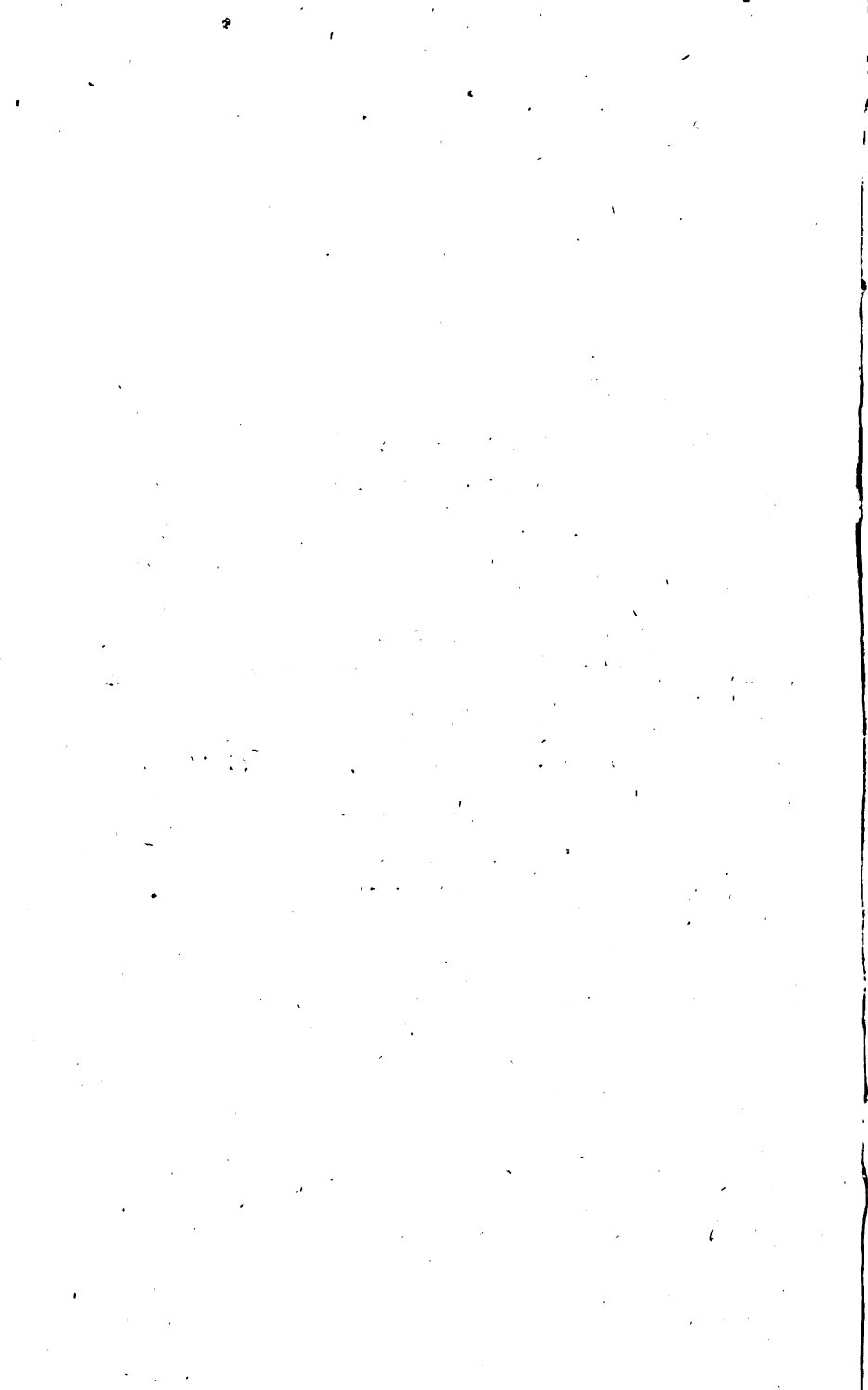
CERTAIN MEASURES CALCULATED

TO

IMPROVE AN EXTENSIVE PROPERTY,

MORE ESPECIALLY

**APPLICABLE TO AN ESTATE IN THE NORTHERN PARTS
OF SCOTLAND.**



TO
THE LORD LIEUTENANT,
AND
THE GENTLEMEN,
OF
THE COUNTY OF CAITHNESS.

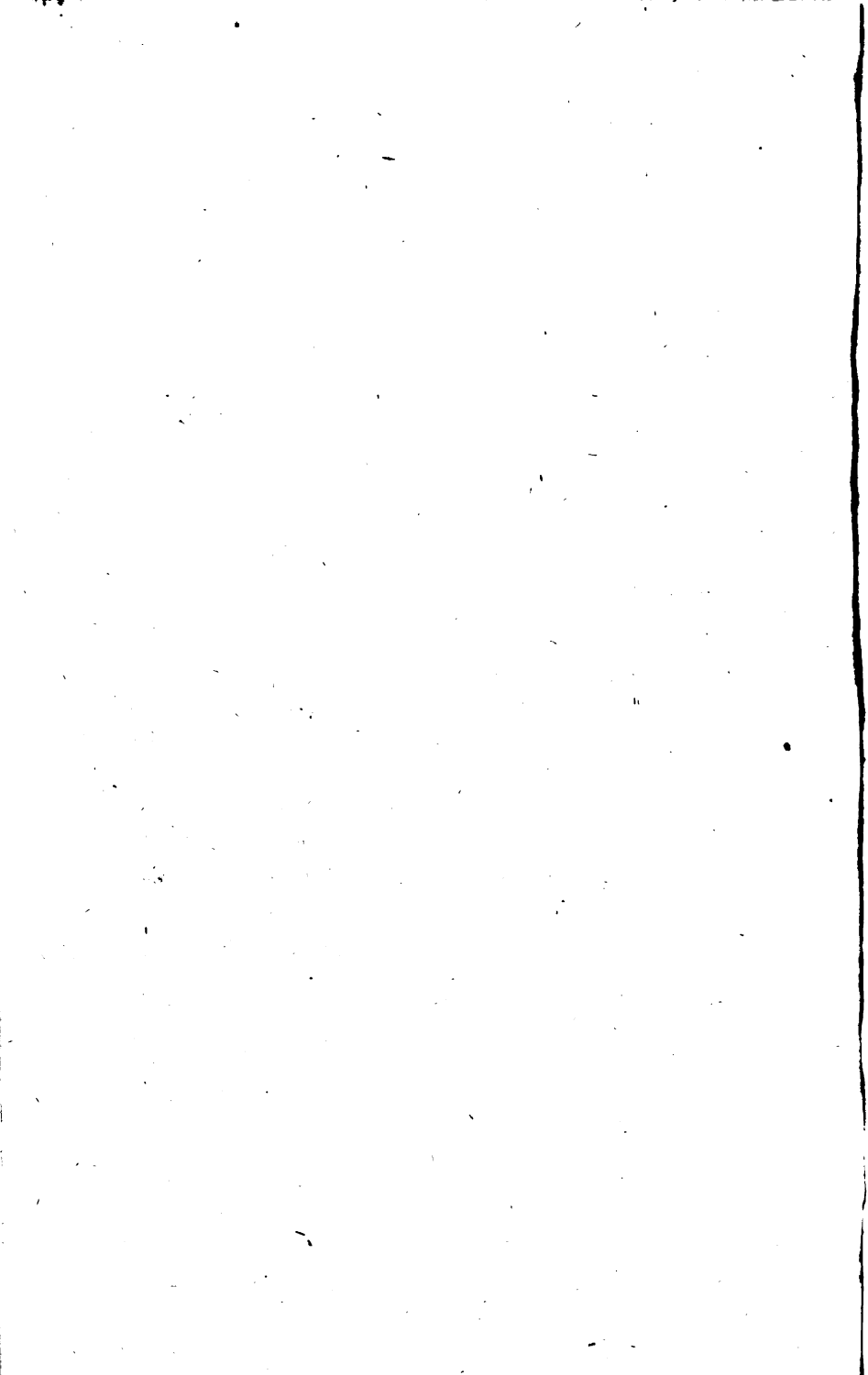
PERMIT me to inscribe the following Paper to you, as a proof of my respect and regard.

Had I not witnessed, last year, the spirit with which you entered into Agricultural Improvements, and the success which attended your exertions, I should hardly have ventured to engage in so extensive an undertaking, as the one which the following pages contain.

May you persevere, with firmness, in the plan which you have so happily begun, that of promoting the substantial interests of the remote corner where our lot is cast; and may the County long continue to shew an example to others, of harmony in itself, and zeal for improvement.

JOHN SINCLAIR.

LONDON,
25th March 1802.



ESSAY VIII.

HINTS REGARDING CERTAIN MEASURES
CALCULATED TO IMPROVE AN EX-
TENSIVE PROPERTY,

MORE ESPECIALLY

Applicable to an ESTATE in the Northern Parts of
SCOTLAND.

INTRODUCTION.

FOR some time past, my attention has been principally directed to inquiries connected with the general state of the country, and the means of its improvement, and I now propose to apply the result of some of the most important of those inquiries, to the cultivation of my own estate. It is certainly unfortunate for such an undertaking that the property in question should be subject to many disadvantages. It lies at the northern extremity of the Island, whither the spirit of improvement has only lately penetrated *, and where many ancient prejudices still exist. The climate is extremely unfavourable to the operations of husbandry. The

* There is no county where, of late, more improvements have been carried on than in Caithness, considering the many disadvantages under which it labours. The Lord Lieutenant, (James Earl of Caithness,) the Sheriff, (James Traill, Esq.) whose exertions have been uncommonly great, and several of the residing gentlemen and farmers in it, have been extremely active. Many respectable proprietors, also, when peace is happily restored, and our military and naval officers can return to agricultural occupations, will, I doubt not, enter with great spirit into the same plan.

country is in general occupied by small farmers, whose lots or portions are so intermixed together, as to prove an effectual bar to judicious cultivation. The sale of the various productions which agriculture affords, from the want of a market within the county itself, is generally extremely precarious, and the price low, unless when a great scarcity prevails in other parts of the kingdom; the commerce and manufactures of the county are at a low ebb; and the district itself is almost inaccessible from the want of roads and harbours.

It may be reckoned, therefore, a bold undertaking, to engage in a great plan of improvement, under these, and other disadvantages which might be enumerated; but the attention I have been led to pay for some time past to subjects of that nature, will, I hope, enable me to surmount any difficulties which may occur. A great inducement also to engage in the attempt is, that if such a plan can be carried through in so remote a corner, it can hardly fail to answer in other parts of the kingdom, where the same sort of obstacles do not take place. The interest of the public, therefore, is implicated as deeply in the success of this undertaking, as, perhaps, in any other of a similar nature hitherto attempted.

Before I venture, however, to carry on such a plan to any great extent, several reasons have induced me to state the measures I have in contemplation. First, because unless a regular plan be formed, and some definite objects kept in view, the operations of one day may be counteracted on the next, and instead of a regular series of improvements being carried on, a series of endless contradictions may be pursued. Secondly, because I could thus form some idea of the labour and expence which the plan might occasion. Thirdly, because it might enable me to obtain the opinions of a
number

number of intelligent friends on the measures proposed. Fourthly, because the printing of such a plan might furnish some hints to others possessing property of a similar description; and, Lastly, because if a plan of improvement were once fairly chalked out, and found to answer, it might probably be carried on by those who inherited the property, when the person who suggested it was no more.

The estate in question being of considerable extent, (above 100,000 acres, of which 40,000 acres either are at present, or might be rendered, arable,) it is necessary, in carrying on the improvement of so large a tract of country, in many respects peculiarly circumstanced, to attend to a greater variety of objects than are commonly requisite for a landlord. But in every situation it seems to me preferable to pursue an extensive, rather than a contracted plan of improvement. Indeed, however problematical it may at first sight appear, I have no doubt that it is much easier to carry on a general and extensive system of improvement (provided a sufficient capital can be raised for that purpose), than one of a partial and insignificant nature. With only a trifling object in view, there is less real anxiety or exertion, the business is conducted with languor, and must ultimately terminate, either in total disappointment, or in a manner but little likely to give much real satisfaction: whereas, when a number of important objects are in contemplation, the powers of the mind are roused, success in one attempt tends to promote success in another; disappointment in one may be compensated by success in others; an emulation is necessarily excited among all those descriptions of persons who are connected with the attempt; and the whole is likely to be

carried on with a degree of energy which can hardly fail to be successful.

The objects to which I have been under the necessity of attending are numerous; and in fact the plan embraces such a variety of particulars, that it resembles a system calculated for the establishment of a new colony, or the improvement of an extensive province. These particulars may be classed under two general heads; namely, 1. Agricultural; 2. Miscellaneous.

I. AGRICULTURAL IMPROVEMENTS.

1. *Arable Lands.* In carrying on the improvement of any district, it is necessary to begin with bringing the lands already under cultivation, into the best order that circumstances will admit. Indeed it is in vain otherwise to think of improving (at least to any extent) either the less fertile, or the waste lands in the neighbourhood. It was well observed by a shrewd farmer of antiquity (the celebrated Cato), that the most essential article of husbandry was to provide food for cattle; and unless the arable part of a farm is brought into thorough good order, how is it possible to provide food, not only to cultivate it properly, but also to improve the inferior and the waste lands immediately adjacent? Before I could think, therefore, of carrying on any extensive plan of cultivation, it was absolutely necessary to begin with thoroughly cultivating one farm of a considerable extent (above 300 acres), which I have brought into such a state, that a foundation is now laid for the improvement of all its neighbourhood. For if one farm be once brought into good order, it is easy to go from one to another, till an extensive district shall have been brought

brought into a complete state of cultivation, and an example of judicious and successful husbandry given to all the neighbourhood.

The usual system pursued, for the improvement of arable lands, I think it unnecessary here to detail; but it may be proper to observe, that the raising of tares, as food for horses and oxen, was found of the most essential importance. They ought to be sown on the best soil, and in a clean state, and then no crop will pay better. The produce of three acres of tares, when the crop is good, will furnish food for horses or oxen, capable of ploughing, once over, no less a quantity than 80 English acres, even of coarse land, two horses or four oxen to a plough. Can there be a stronger argument in their favour? The seed of tares also is not so expensive as that of clover; it does not remain so long on the ground; when cut green, it is rather a fertilizing crop than otherwise; there is no food, corn excepted, that seems to agree better with horses or oxen, when constantly worked; if horses or oxen are fed in the house, or soiled with them, there is no article that produces a greater quantity of valuable manure, and they are an excellent preparation for wheat or other grain. On the whole, I consider the cultivation of tares to be of the most essential importance in carrying on an extensive system of improvement; at the same time it is my intention to try other articles, chicory in particular, which Mr. Arthur Young and other respectable farmers, have so strongly recommended.

* For further particulars regarding tares, I beg to refer to Middleton's Survey of Middlesex, p. 198. Tares are much better for being sown with a little winter rye, oats, or bear, (properly winter barley,) or wheat, which gives them a tendency to run up, instead of spreading on the surface.

With the assistance of tares, and other productions for feeding stock, as clover, &c. I have already been enabled to bring into culture about 200 acres of waste lands, in addition to the 300 acres already mentioned, and the progress will now become rapid. Indeed I am satisfied that the true mode of carrying on the improvement of an estate, is for the proprietor gradually to take not only the arable but the waste lands into his own hands, to divide the whole into regular farms, and to put them into good order before he lets them; and this plan may be effected not only without loss, but with profit. Farmers in general grudge almost every shilling they lay out, and expect 15 per cent. for their money; whereas if the landlord gets a perpetual addition to his rent of from 5 to 10 per cent. (and with good management, he may expect even more,) it is the most certain, if not the most productive, of all speculations.

In a tract of country where there are about 40,000 acres of land capable of being rendered arable, a number of corn farms must necessarily be established; and it is much in favour of this remote district that the crops were abundant there, even in the years 1799 and 1800, when they failed in so many other places. According to the old system of the country, the stock land, or the best soil (provincially *infield*), was under a perpetual and alternate rotation; 1. of an inferior sort of barley, called bear or big; and 2. of oats. The *outfield*, or less fertile soil, was occasionally ploughed for oats, until it would produce hardly any crop; it was then left to rest until it gathered some sward, and was then again treated in the same barbarous manner. No system could be more wretched, or more ruinous to the landlord and the tenant. Fortunately, however, the spirit

spirit of improvement which has lately arisen in the county, is likely to be attended with the most useful consequences. Every intelligent farmer in it is now satisfied that a rotation of 1. turnips, 2. bear, 3. clover, (with a mixture of other grasses) and 4. oats, is the best general system to pursue. Instead of bear, some farmers wish that barley could be substituted; but every season will not produce that grain in perfection in that northern climate, excepting in the immediate neighbourhood of the sea. When the land is brought into perfect good order, there is nothing either in the soil or climate unfavourable to the culture of winter rye, or even wheat, provided they are sown in the middle of autumn. In a considerable part of the county, that species of grain called the *red oat*, has been introduced with much advantage; and from its superior earliness and good quality, has materially contributed to the abundant harvests which Caithness has lately experienced.

2. *Grass Lands.* There are very few natural meadows on this property, and these must be drained, and incorporated with the arable part of the different farms. There is reason however to believe, that a considerable number of acres may be converted into water meadow; and as soon as the leases of some farms on the banks of the river Thurso, &c. shall expire, it is proposed to attempt that important species of improvement. For the purpose of ascertaining to what extent it might be carried, I employed, in the year 1796, two flooders from Gloucestershire, Charles and Richard Stephens, to examine both sides of the river Thurso, who reported, that in the parish of Thurso there were about 30 acres, and at Brawl, in the parish of Halkirk, about 70 acres, besides 100 acres at Dalemore, Knockdow, and Dalwacher; and a great extent of land in other places; and that the above lands might be brought under the operation

operation of flooding for about 4*l.* 10*s.* per acre, every expence included. The advantages would necessarily be very great.

On the subject of grass lands, where watering cannot be used, two particulars occur, which it may be proper to mention: the first is, the impropriety of relying so much, as is usually done, on red clover and rye-grass, either for hay or pasture. They are certainly valuable articles, and ought never to be totally given up; but there are other sorts of grasses, some of which I propose trying on a considerable scale in the course of this year, which will probably answer better in some soils, and perhaps in all soils, should, in different proportions, be mixed with them, more than hitherto has been the case. The result of the proposed experiments I shall certainly communicate to the public as early as possible. The other particular alluded to is, an idea that grass should never be laid down without a crop of corn; that, however, is a mistaken notion. Land, if intended for grass, cannot be too well cleaned, more especially if permanent pasture is the object in view. In many cases, therefore, the best plan to adopt is, to clean the ground thoroughly with a summer fallow, and to sow the grass-seeds early in August, without any grain. The field should then remain untouched until next year, when a crop of pasture grass may be expected, of unusual value and bulk. This mode requires not the same quantity of manure that is indispensably necessary where a crop of grain is also taken; and this is a material circumstance in its favour, more especially for farmers at a distance from large towns, who must find it difficult to procure dung in sufficient quantities for all their crops.

3. *Waste Lands.* The improvement of the extensive wastes connected with this property, is an object attended

tended with numerous difficulties; first, because many of them are in a state of commonage, and until a division shall have taken place, they must remain uncultivated; measures, however, are now in train for having several of these commons immediately divided: and secondly, because much skill and experience are required to suit the different sorts of improvements, to the various soils of which such wastes may consist. On the whole, however, they may be considered under three separate heads; namely, 1. The wet boggy lands. 2. The dry heath lands; and, 3. Green commons, with rather a fertile soil, though much impoverished by the depredations committed on the surface.

In regard to the boggy lands, there is no system equal to the husbandry of Lincolnshire, Cambridgeshire, and the other fenny districts of England, the foundation of which is paring and burning. The paring plough carries on its work with a rapidity and perfection hardly to be conceived by those who have not witnessed the operation. The expence is moderate, and the crops, in favourable seasons, are most abundant. Hitherto, this excellent system has been confined to low districts, apt to be overflowed, and the Cambridgeshire husbandman, by whom it was introduced into the county of Caithness, could hardly believe it possible that the same species of soil could any where be found exempted from any risk of that calamity. On the whole, there is reason to believe that this is the greatest source of improvement that has hitherto been introduced into the Highlands*.

The

* I have no doubt, at the same time, that some improvements may be introduced into this plan of cultivation. Instead of the second ploughing to cover the seed, which is a clumsy mode of doing it,

The dry heath land must be treated in a different manner ; being in general stony, it is impossible here to make use of the paring plough *. The best mode therefore is, to employ a strong Scotch plough, and to harrow the land with a strong break harrow, then to gather every thing that will burn, as tufts of heath, peaty clods, &c. and to convert them into ashes on the surface. As soon as the ashes are spread, the crop should be sown. This being, in general, a coarse soil, it should be ploughed in the end of autumn, and during the winter. If thus it can be brought into a tolerable state in the spring, it may be sown with oats, if not till the next summer, with turnips, and if not till the ensuing autumn, with winter tares or winter rye.

In regard to the third sort of waste land, namely, commons with a green sward, a third plan must be adopted. The best mode of cultivating them is, by paring with a breast plough †, and burning the sward that is thus cut off. There is no mode by which such land can be brought into cultivation with so much certainty, and at so small an expence. The breast ploughing and burning may be done for 20s. and from thence to 37s. per acre, according to the nature of the soil ; which, though attended with more expence than when a plough is used, yet cannot be reckoned high. When the par-

it, a scarificator, or cultivator, may answer better. Perhaps drilling may be substituted with advantage instead of the broadcast husbandry. Several new sorts of grain, and grass, also, may be successfully introduced, some experiments regarding which I propose trying next summer.

* If the land is very full of stones, the beating mattock or axe must be used.

† In Devonshire they use the thigh, and not the breast, for the paring spade ; I propose trying both plans this summer.

ing is properly done, and only a small portion of the surface of the soil is taken off, any apprehension that the soil can be injured thereby is perfectly unfounded. By the process of paring and burning also, the land is not only brought into cultivation, but a number of insects with their larvæ, by whose ravages the future crops might be materially injured, are destroyed.

But though I consider paring and burning to be so valuable a means of bringing waste lands into a state of culture, yet, as a general rule, it can hardly be doubted, that they ought to be laid down as early as possible into grass, and pastured for some years before they are again broken up. The first crop, however, under proper management, ought to pay for the expence of the improvement, and such lands ought afterwards to yield a handsome rent to the proprietor, under a grazing system, for pasturing either cattle or sheep, according to their situation or fertility.

In regard to carrying on such improvements in the county of Caithness, it is a most unfortunate circumstance that lime is rarely to be met with, and that it can hardly be imported from other counties, except at a most enormous expence, rendering any considerable use of that important article scarcely practicable. Fortunately shell marl may be had in some places; and where peat abounds, there is no cheaper manure than to convert it into ashes, and to sow it in drills, or to spread it on the surface of the soil, by either of which modes, particularly that of drilling, a small quantity goes a considerable way. I am also convinced, that burning clay might be the means of obtaining a cheap and valuable manure, not much inferior to lime. As to these two points, however, I cannot at present state any decisive experiment, though I hope, in the course
of

of the ensuing summer, to have both ascertained, having applied for that purpose to Mr. Dundas, member for Berkshire, to procure me a person for burning peat, and to Mr. Wilkes, of Measham, and Mr. Buckley, of Normanton-Hill, for a person skilled in burning clay.

The Berkshire mode of burning peat in great masses, and even in wet weather, is a practice which ought to be known in all the hilly districts, more especially where the climate is rainy, as it is hardly possible otherwise to obtain the benefit that ought to be derived from the inexhaustible quantities of peat in many parts both of Great Britain and Ireland. The burning of clay also, (and Mr. White Parsons, in Somerset, uses no fuel but the turf dug from the surface of his ditches,) must be another source of infinite improvement, and indeed, is by far the best and cheapest mode of improving cold and barren clays, hitherto attempted*.

4. Cattle

* As these two most important operations in husbandry are but little known, except locally, it may not be improper to give a short account of them.

I. Berkshire Mode of burning Peat.

The peat is dug with an instrument peculiar to that part of the kingdom, and in three weeks or a month is fit for burning. They begin to dig as early as March, and the peat, when properly dried, is burnt in large heaps, about three feet wide at the beginning, but widening to ten feet and upwards, and sometimes from eight to ten yards long. Some heaps will require three months to burn. If the peat is properly dried, there is no difficulty in keeping the heap constantly burning, *even in the wettest weather*, which is a most material circumstance in favour of this practice. A heap of a good kind of peat will produce from 320 to 400 bushels of ashes; and 10 bushels are sufficient for an acre. The Berkshire peat produces red ashes, which are greatly preferable to the white. The ashes are spread on the surface with a small shovel, and never meddled with afterwards. The ashes are found most useful, 1. *To Turnips*, when they are coming

4. *Cattle Farms.* It is probable that some cattle and dairy farms might be established in Caithness with much advantage; more especially in the neighbourhood of the two towns. In many parts of the county, (as Ackergil, Duncansbay, Sandside, &c.) the pasture is excellent, and the butter of Caithness, when properly prepared, rivals in quality that of Holland or Flanders. In establishing a dairy farm, the first point to be attended to is the sort of cattle. Various breeds have, at different times, been imported, as the native kind were of inferior quality. The Herefordshire breed was tried, but was found too delicate, and the Lancashire breed

coming into the rough leaf; 2. *To Wheat*, in February; and, 3. *To Clover*, in March. One man, with five or six assistants, could make 20 heaps sufficient to manure from 300 to 400 acres. The ashes, if not immediately used, are kept till next year, in houses made for the purpose, and if preserved dry, do not suffer from keeping. The price of ashes in Berkshire is 5*d.* per bushel; and an acre of good peat land, for ashes and for fuel, is reckoned worth from 100*l.* to even 300*l.* It is probable that, with the aid of an *ash drill*, this excellent manure may be used to still more advantage, particularly for turnips, sowing the seed either with, or above the ashes.

II. *Leicestershire Mode of burning Clay.*

Mr. Buckley, of Normanton-Hill, informs me, that every kind of clay will burn well that is not in a pulverized state. The mode of doing it, is by a number of small fires, made about 18 inches asunder, and of such a shape as will give the burner the least trouble in forming the heap. A ton of coals will burn ten cart loads of clay, some more and some less, according to the dryness, or state the clay is in. Forty cart loads are sufficient for an acre, but sometimes 100 have been used. Upon strong land it is *the best of all dressings*, altering the texture of the soil, and making it work better. It is best to lay it on fallows, and to mix it well with the soil; but it may be used to advantage on clover or grass; it is not so well calculated for light soils. Where coals can be had cheap, there certainly cannot be a better system of improvement for strong lands.

was too large for the generality of the pastures. The Galloway, and the West Highland breeds, though admirably calculated for droving, or felling as lean cattle merely, were not so fit either for milk or labour. On the whole, if foreign cattle must be imported, I am rather inclined to give the preference to the breeds of Fifeshire, and of Angus or Forfarshire. They are of a moderate size, have of late been much improved in point of shape, and have been found well adapted for working, for droving, and for the dairy. At the same time I have little doubt, if the native sort were properly fed from their birth, and the best selected for the purpose of breeding, that few cattle from other places, for the sake of improvement, need to be imported.

In carrying on dairy farming, the Irish system seems, on the whole, the fittest to be adopted in this part of the Island. If the milk cannot be sold to advantage in its original state, the whole should be churned according to that system, and not the cream alone. A sort of butter is thus obtained, admirably calculated for exportation; and which would furnish an excellent article for the West India trade, proposed to be established at Thurso. In Ireland they use plunge churns, two or three of which can be managed by one man, with the assistance of a lever. Even a moderate sized cow, if properly fed, and carefully attended to, will yield, by the sale of butter, butter-milk, &c. a very considerable income*.

5. *Sheep*

* The following particulars have been communicated to me regarding an Irish dairy. The cows at an average did not exceed 6*l.* each, and were the usual run of the country. The year round, being well fed, they gave at the rate of ten English quarts, or five Scotch pints, per day, which being all churned, produced a pound of butter, which

5. *Sheep Farms.* To improve rich and fertile districts, with a favourable soil and climate, and in the neighbourhood of good markets, is attended with little difficulty; but to bring hilly districts, in a remote part of the kingdom, to a state of profitable production, is a very different attempt. A variety of obstacles must, in that case, be surmounted, arising from soil, climate, distance from market, bad roads, and a number of other discouragements, which nothing but zeal, industry, skill, and above all the hopes of profit, can possibly overcome.

Of all the means of bringing a mountainous district to a profitable state, none is so peculiarly well calculated for that purpose as the rearing a valuable breed of sheep. A small proportion alone of such a country can be fit for grain; and in regard to cattle, for every pound of beef that can be raised in a hilly district, three pounds of mutton may be obtained, and the wool into the bargain. Besides, wool is an article easily transported from one place to another, of essential use, for

which sold at from 10*d.* in summer to 13*d.* in winter, *per lb.* 14 ounces to the pound. The milk in summer sold for 10*d.* *per* gallon, or 5*d.* *per* Scotch pint; and in winter for 1*s.* *per* gallon, or 6*d.* *per* pint. The butter-milk at 4*d.* *per* gallon, or 2*d.* *per* pint. The cattle were fed upon grass, hay, a little turnips, very trifling in quantity, some grains, and potatoes, about three days in the week, scalded; and 7 lb. weight to each cow; on other days about 3 lb. of oats ground, husk and all, into a coarse meal, and boiled. According to the above statement, the butter alone, at a pound *per* day, and at one shilling *per* pound, would produce 18*l.* 5*s.*; in addition to which there is the profit of the manure, the calf, and the butter-milk. The cows must be changed once a-year, but that is generally done at the expence of a guinea each time. The calf at present only produces from three to four shillings; but if reared on hay-tea, linseed-gruel, &c. would become much more valuable.

which there is a regular demand, and capable of infinite improvement. Sheep also generally sell with less variation of price than cattle, and are easily driven to market. Impressed with these ideas, there is no circumstance connected with a very anxious zeal to promote the internal improvement of the country, from which I have received more satisfaction, and from which I am likely to derive more profit, than from the introduction of that species of sheep, now known under the name of the "*Cheviot breed*," the history of which I shall briefly state.—

As Chairman of the British Wool Society, it was a duty incumbent upon me to make a very general and extensive inquiry into the different breeds of sheep in the Island, and the qualities which they respectively possessed; and in consequence of that inquiry, it appeared to me perfectly indisputable, that a breed of sheep was to be found on the borders of England and Scotland, peculiarly well calculated for a mountainous district. I was thence induced to try a flock of five hundred ewes, on a Highland farm which happened then to be in my possession, and found them to answer so well, that I am augmenting that farm to the extent of about 25,000 English acres, and adding annually to my different flocks, with a view of increasing them to at least ten thousand, of all ages, which, considering their number and value, will probably rank the farm of Langwell among the first sheep farms in the Island*.

But though I consider the Cheviot breed to be an admirable foundation for a mountain stock, yet they are certainly capable of considerable improvement, both

* The sheep are kept in what are called *birfels*, or flocks of from 500 to 600 sheep, each under a separate shepherd, and there is, of course, one who has a superintendence over the whole.

in regard to their shape and wool. Various experiments, however, will be necessary before these points can be obtained, without injuring the constitutional hardiness of the breed, so essential for a bleak district.

The mode of managing this breed also may, in various respects, be materially improved; first, by procuring better pasture for them, by means of draining wet and boggy places, and cultivating various grasses fit for a moorish or peaty soil, where, at present, nothing but heath is produced; secondly, by watering land calculated for that purpose, either for pasture or hay; thirdly, by cultivating rape, the common and the Swedish turnip, winter rye*, tares, clover, rye-grass, &c.; and lastly, by folding; a practice which though exceptionable in an inclosed country, yet may certainly be adopted with much advantage in a district, where there are great tracts of waste pasture, interspersed with some spots of land capable of cultivation, for which sheep folding is so excellent a manure.

The great difficulty in carrying on the improvement of the property I am converting into a sheep farm, arose from the circumstance of its being occupied by 80 small farmers, who did not pay in all above 250*l. per annum*. Nothing could be more absurd than to suffer such an extensive and valuable district to be employed almost in nothing but in breeding an inconsiderable number of cattle, and feeding some red-deer, who wan-

* Mr. John Wilkinon of Castle-Head, in Lancashire, an active and respectable improver, tried trefoil, mixed with a small quantity of white clover, on moss, with rye, and which answered completely. The first crop after the rye was cut, and in the same season, was worth 5*l. per* Lancashire acre. The rye was sown in September, the trefoil in Spring. In a piece adjoining, and under the same degree of cultivation, which was sown with barley, but not cut till some time after the rye, the trefoil was so smothered as to yield no crop till the ensuing spring.

dered about the upper parts of the estate. Humanity however required, that above 500 individuals, who inhabited the estate, should not be driven from their ancient possessions, without having some other means of subsistence pointed out to them : hence it was necessary to proceed with caution in extending the farm, and to form some liberal plan to provide for the people. The following measure was at last adopted for that purpose,—that of giving two Scotch acres of arable land, or at least fit to be made arable, with a house and garden to each of those little farmers, under the name of “*Cottage Farms*,” the proprietor becoming bound to employ them for 100, 200, or 300 days in the year, as the cottager chose, paying the labourer so much grain, and so much money, in proportion to the number of days agreed upon ; and thus the cottager, in a manner, received rent from the landlord instead of paying any. No plan could succeed better than this has hitherto done. It required not only the labour of these cottagers to carry on a variety of improvements essential in an extensive tract of country, formerly almost in a state of nature, but it was necessary to employ a number of experienced labourers from other places to assist them, whose example has been of much use. I soon found that the plan was admirably suited to the temper and spirit of the Highlander, who was not fond of constant labour, but had no objection to work for a certain number of days, provided he had the remainder of his time free and uncontrouled. By adopting this plan, every possible means was taken neither to diminish the number, nor to crush the spirit of a brave and hardy race of men, whose services in war might be so eminently useful ; whilst at the same time a habit of industry was introduced among them, far beyond the expectations of those who were best acquainted with that property in
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its former state, when hardly a single labourer could be procured in it*. Measures were also taken for furnishing the women with employment: a number of spinning-wheels were distributed among them, made by wheel-wrights who were set up for that purpose, and who have also undertaken to distribute flax to be spun, intrusted to their care by Messrs. Mill, Cruden, and Co. a respectable manufacturing company at Aberdeen. The whole is certainly an operose and complicated system; but as it has completely answered in this instance, I cannot too strongly recommend the adoption of a similar plan to the attention of those who may be desirous of improving a Highland estate, without depopulating their country.

6. *Farm Buildings.* There is no species of improvement which, by proper exertion, may not be made capable of repaying the expence that has been incurred, and that in a very short period of time, buildings alone excepted. But as houses and offices are absolutely necessary, where any cultivation is carried on; it is of great importance to discover what is the best plan, and the cheapest mode of erecting such buildings. On the

* After much consideration of the subject, I have no hesitation in stating, that this is by far the best plan to adopt, for improving, without depopulating the country, a highland estate, and introducing industry among its inhabitants. I have already got from 30 to 40 labourers established on this footing, where formerly scarcely one could be procured on any terms. Where the land they occupy is arable, they pay a moderate rent; and where it was in a waste state, they have it for five or seven years for nothing, besides having it ploughed for them, being furnished with seed, &c. The days they work are not indefinite, but fixed by themselves, and they receive for 100 days two pounds ten shillings in money, and three bolls of meal, and so on in proportion, being about the same wages that a farm servant has in that part of the Island,

whole, the best system to pursue seems to be that of building them either by the landlord himself, or according to a plan laid down by him, and on a moderate scale. Annexed, the reader will find an engraving of a house and offices, built for a small farm I am now in possession of, which, without being attended with much expence, yet, from its having the appearance of an ancient Gothic building, has become a distinguished ornament to all the neighbourhood.

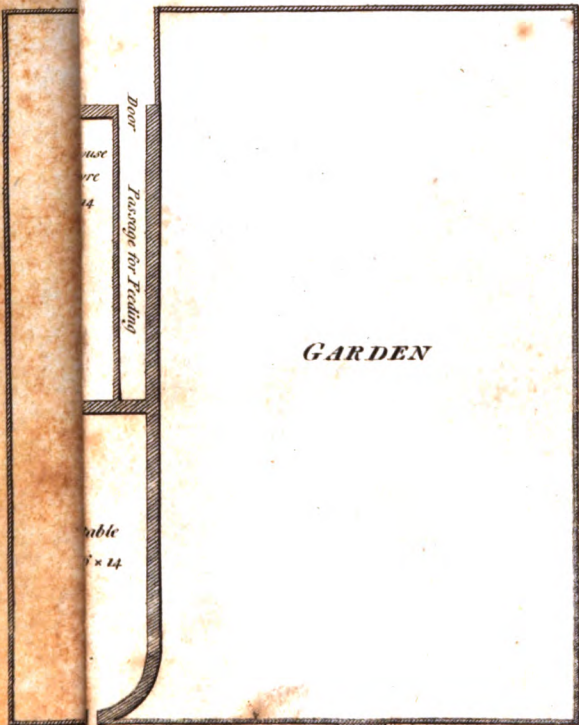
7. *Leases.* In carrying on these improvements, it is not my intention to retain a great extent of arable land long in my own possession, but to let it, farm by farm, as soon as the land is brought into a state of cultivation, I propose first, to have very accurate plans drawn of the ground in its present state: Secondly, to ascertain the nature, not only of the soils, but of the subsoils, the latter often furnishing the readiest means of improving the former: Thirdly, to divide the whole into fields, not attending so much to regularity in point of form, as to uniformity in regard to quality of soil; for unless a field consists of nearly the same soil, how can the same plan be pursued in its cultivation? Fourthly, to fallow the land, so as to put the whole in a clean arable state: Fifthly, to erect what buildings may be necessary, which a person carrying on a number at the same time, can do cheaper, more especially in new farms, than even a farmer with all his attention, who has only one to execute; and then to let the land, when thus prepared, to the best farmer that offers, on a lease of twenty-one years, under obligations for completing the improvements; taking care, at the same time, that the entry of the tenant shall be at that season of the year, for instance, some time in May, when the crops of grain will be in the ground, so that the proprietor shall be entitled

to

Offices
Huttness,



LIVERPOOL
LIBRARY

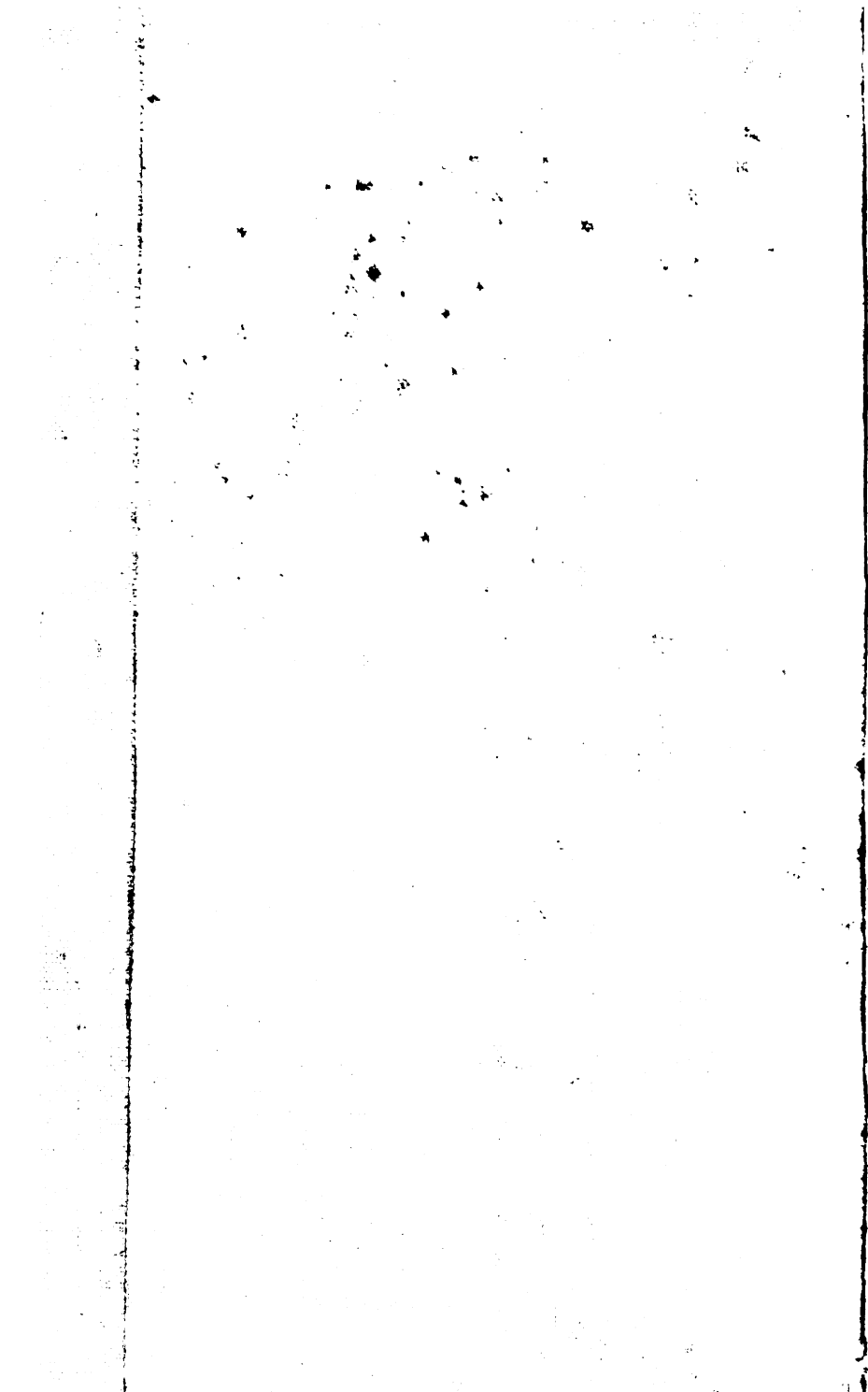


GARDEN

Door
Passage for Feeding

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14

14
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to the first crop, over a great part of the land that has been fallowed, the profit from which, if grain sells at a tolerable price, will repay a considerable proportion of the expence laid out in the improvement.

I am satisfied that landlords who set about improving farms with a view of letting them afterwards, sustain great loss by keeping them too long in their own hands. Their object ought to be, to carry on the great outlines of improvement only, and to allow the remainder to be done by time, and by the exertions of an attentive husbandman, who is able to complete the minuter articles cheaper and better than a landlord. In this way also, more capital is employed, and more industry exerted, in the improvement of an estate, and the proprietor can go over the whole of his property in half the time, with half the capital, and, probably, with double the profit.

As to the nature of the lease, I certainly think 21 years is a proper medium both for landlord and tenant; but such a term ought to be accompanied with fair and judicious covenants for improvements, otherwise a tenant may delay executing them, from year to year, until at last he believes the lease is so near a conclusion, that he could not be indemnified during its currency, for the expence which the improvement might occasion. Leases are of great use, as fixing a time when it is peculiarly incumbent both on the landlord and on the tenant to examine the condition of the land*; and

* On well regulated estates in England, (as Mr. Coke's of Norfolk,) a *field book* is kept, by an examination of which a landlord knows exactly the number of acres in his estate, under grass, and under each species of crop, the exactness of which is ascertained every year: but when a new lease is granted, a more particular examination must be necessary.

covenants, when judiciously formed, are indispensably necessary : first, to keep up the attention and exertions of a farmer disposed to indolence, who might otherwise be inclined to postpone essential improvements, if the season happens to turn out rather unfavourable, if stock could not be purchased but at a dear rate, or any accident happened to his cattle ; secondly, to prevent the injury which a proprietor might sustain from the misconduct of an ignorant farmer ; and, thirdly, to protect the property from being plundered and destroyed by a roguish farmer, who having possession of the land, may resolve, by exhausting crops, to enrich himself at the expence of the proprietor. There is no profession that can boast of a greater number of fair and honourable characters than that of husbandry ; but it is necessary for an attentive landlord to guard against the exceptions to the general rule, which are sometimes to be met with. Besides, it is easy to relax, if the covenants are found to be injurious. But if a landlord leaves his property entirely at the mercy of another, he may sustain an injury almost irreparable.

8. *Plantations.* It is a most unfortunate circumstance for this part of the kingdom, that it is so extremely ill calculated for planting. The county of Caithness being a point at the extremity of the Island, two-thirds of it is surrounded by the sea, the spray from which is extremely injurious to the growth of trees. The soil of a great part of the district also, lies on a flat rock, which prevents the roots of the trees from penetrating to a proper depth ; and hence, even where they do survive, they are extremely stunted in their growth. That part of the county, however, that joins to Sutherland, is of a different description. Instead of being flat, it is of a hilly nature ; and there is every reason to hope, that trees

trees will grow there to considerable perfection, both along the banks of the rivers, and the sides of the hills. It is therefore proposed to try plantations to a pretty considerable extent in that quarter of the county*.

No mode of improvement is attended with so small an expence,†, and is ultimately so productive of profit as that of planting. The shelter also which it affords is a very material consideration, and it is of great importance to raise so bulky, and, at the same time, so essential an article as timber, as near as possible to the place where it is to be used. Trees also grow in barren spots, incapable of other improvement; and as large sums of money are sent out of these kingdoms for purchasing foreign timber, it is desirable that the growth of domestic plantations, more especially such as are the most essential for the preservation of our naval power, should be encouraged as much as possible.

Such are the agricultural and territorial improvements I have in contemplation, which I hope will now be carried on successfully, as the basis is fortunately laid. The reader will perceive, that the greater part of them

* There are some very important observations on the advantages of planting waste lands, and the trees best calculated for that purpose, by Thomas Richardson, Esq. in the Manchester Memoirs, Vol. IV. Part ii. p. 345; and in Vol. V. Mr. White mentions three sorts of trees, the black American birch, with broad leaves; the Athenian poplar; and the iron oak, with prickly cups, which seem to be well calculated for growing near the sea, and consequently particularly valuable in maritime situations. On the whole, however, no tree seems to stand the sea air better than the sycamore, more especially if planted in great masses.

† In some cases the expence must be considerable, as the ground must be prepared by trenching for the young trees; nor is that expence ill bestowed; but in general less trouble is necessary.

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are founded on information, partly collected by the Board of Agriculture, and partly by the Society for the Improvement of British Wool; and indeed, if in consequence of my connection with those two valuable institutions, I had not had an opportunity of examining the agricultural practices of the different counties in these kingdoms, and of ascertaining the properties of the different breeds of sheep in the Island, it would have been impossible for me either to have formed such a system as the one above detailed, and far less to have carried it into effect.

But agriculture is not the only particular to be attended to, in the formation of a great system of improvement, more especially for a remote part of the kingdom; unless some means are also taken to rouse a spirit of exertion, and to secure a certain market, and regular demand for the articles produced, which is the necessary result of successful industry, and increasing population and wealth, it is impossible that the farmer can flourish*: and though country gentlemen cannot themselves engage in commerce, manufactures, the fisheries, mining, &c. more especially when their capital is employed in agricultural pursuits, yet they may give

* A striking instance of this occurs in the neighbourhood of Thurso. I improved a farm immediately opposite to that town, fifty acres of which were of excellent quality; but though they were inclosed, and brought into thorough good order, I could only let them, about fifteen years ago, at 15*s.* per acre. I saw then the necessity of promoting a spirit of commercial industry, as the best means of encouraging agricultural improvement; and the event has turned out as might be expected. Since a spirit of industry has been introduced, good arable land, in the immediate neighbourhood of Thurso, will let at from 3*l.* to even 5*l.* per acre; and even waste lands, after being once ploughed, will yield from 15*s.* to 25*s.* per Scotch acre.

so much countenance and encouragement to such undertakings as may answer the purpose effectually. I shall proceed therefore to state those miscellaneous sources of improvement, the success of which, indirectly and circuitously indeed, but ultimately with great effect, tend to promote the rural interests of a district*.

II. MISCELLANEOUS IMPROVEMENTS.

I. *Commerce.* It is surely unnecessary to state how essential commerce is for the prosperity and improvement of any country, were it only for the purpose of providing a market for the surplus productions of agriculture. Had the farmer only to supply his own family with food, his operations would soon become languid, but when he can dispose of any surplus, either to be consumed at home, or exported abroad, and in exchange can obtain the various articles for which he may have occasion, his industry necessarily increases, his energy and activity doubles, he accumulates wealth or capital, and is thus enabled to extend his sphere of cultivation, to improve his stock, the grain and other articles he

* In a district where the improvement must arise from converting a number of small farms into such as are of a proper size, for carrying on a judicious system of cultivation, attention to commerce, manufactures, &c. is necessary, to furnish employment for the people who must thus be deprived of their usual mode of subsistence, as well as to provide a market for the productions of agriculture. Many, however, cannot bear the idea of changing the general system of a district, though it is hardly possible otherwise to introduce any spirit of improvement into it, nor to vanquish the prejudices of farmers, if they remain exactly on the same spot; in that case all that can be done is to promote improvement by premiums, and to reserve the power of laying out money on substantial improvements, at a proper interest, or to tempt the tenant to lay out his capital in carrying on the most essential improvements, by a long lease, under proper stipulations.

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fows, the instruments of husbandry he uses, &c. &c. Thus the intercourse and commerce that takes place between the farmer and those who follow other occupations, tend to their mutual comfort and prosperity. It is a most unfortunate circumstance, therefore, for any district, if it does not enjoy the advantages of domestic, and even of foreign commerce. Hitherto, the commerce of the county of Caithness has been extremely insignificant. It has principally consisted in exporting, not manufactured articles, but the raw productions of the soil, as grain and cattle, together with some fish, and importing timber, groceries, woolens, &c. It is now in contemplation, however, not only to carry on a trade with the Baltic, but also a direct commerce with the West Indies. Inquiries have been made for that purpose in several of the West India Islands, and there is reason to hope, as soon as the harbours of the county are completed, that an advantageous intercourse will be carried on.

2. *Manufactures.* As any political society increases in number, it is impossible, even by means of agriculture and commerce, to furnish sufficient occupation to the people, unless a considerable proportion of them are employed in improving their own productions, or those of other countries imported for that purpose: hence the advantage of manufactures. For thus the inhabitants of any country are not only enabled to supply themselves with the articles for which they have occasion, but they can also export the value of the surplus productions of their own soil, in the shape of manufacture, the price of which furnishes the workman with money to purchase the various articles of provision he consumes. Thus manufactures materially tend to encourage the agricultural industry of their neighbourhood.

It

It is unfortunate that no extensive manufacture has hitherto been established in Caithness. Those that have been attempted have been conducted on a small scale, and have been extremely successful. It was of the utmost importance, however, to ascertain what species of manufacture was the most likely to answer, if carried on to some extent; and after making every possible inquiry regarding various articles, I am satisfied that some branch of the linen manufacture ought to be preferred, and stands the best chance of succeeding in Caithness. That this subject may be fully understood, I subjoin the following statement: 1. Of the advantages possessed by the county for the establishment of the linen manufacture: 2. Of the obstacles to its success; and, 3. The plan of a company by whom that manufacture might probably be successfully carried on.

In regard to the advantages which Caithness possesses; First, it is well known, and has been already proved, that flax might be raised there in great quantities, and of very good quality; and there is reason to believe that the Board of Trustees in Scotland would send a proper lint miller to the county, both to superintend the culture of the flax, and the manufacturing it into lint.

Secondly, there are great numbers of spinners in the county, who spin fully as cheap as in any part of Scotland, and by attention might be greatly improved, especially as the establishment would be patronised by the principal proprietors, and that many of the principal merchants would be actually concerned in it.

Thirdly, there are a number of weavers in the county, who, in general, weave well, and a great influx may be expected when the war is over. The price of weaving, it may be expected, will then be as low as in any of
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the manufacturing counties, even in the north of Scotland; more especially as the expence of living will probably be less.

Fourthly, it evidently appears, from the specimens of linens bleached at the Thurso bleach-field, that there is nothing in the climate or water to prevent linen from being as well bleached at Thurso as in any part of Scotland.

Lastly, the communication between Thurso and Leith, and even London, is sufficiently regular to open the means of an easy intercourse with all the markets in the south.

The disadvantages are, 1. The high price, at present, of Dutch flax, on which the manufacture must depend, until the raw material shall have been raised at home. 2. The want of demand at present for yarn, and the low price, if sold; and as the making of yarn ought to be the first object of the proposed company, particular attention should be paid to improve its quality, so as to insure a ready market. 3. The great wages naturally expected by the weaver at present, owing to the high price of provisions, and the scarcity of hands in consequence of the numbers that have gone from Caithness into the army and navy, which would make it difficult to stand a competition with the Perth and other manufacturers, until the wages are lower; and, lastly, the low price of linen, at this time, is much against a new establishment.

But as the advantages are so great, and the disadvantages are principally of a temporary nature, either capable of being removed by attention on the part of the manufacturers, or likely to cease with the war, I shall proceed to sketch out the plan of a company for carrying on the linen manufacture at Thurso, to be established

finished as soon as circumstances may render it advisable.

1. It is proposed to begin with such a capital as can be raised by subscription, the manager taking a certain number of shares.

2. That the buildings shall consist of a manager's house and warehouse, a boiling work, and a heckling house, to be built separate from the rest, together with a weaving shop of six or eight looms, with accommodation above for such workmen as weave the better sorts of cloth, and can teach apprentices. Such buildings to be erected by the gentlemen of the county, and let by them for five or seven years at a moderate rate, that the company may have their whole capital employed in carrying on their business.

3. That the salary of the manager shall be 100*l. per annum*, with a free house, and as much ground as will maintain a cow and horse, which there is reason to believe will be furnished to the company gratis.

4. That as soon as circumstances shall render the establishment of the company advisable, a meeting be held at Thurfó, to agree on the rules, and to fix on the particular objects in which the capital shall be employed*.

3. *Fisheries.* In comparing the various sources, whence either the wealth of a country, or the subsistence of its inhabitants may be derived, there is none which seems of greater importance, in proportion to its extent, than the fisheries; for the cultivation of grain,

* I know well that many such plans have failed; that the managers have turned out rogues, and that the business of the Company has been neglected; but there are examples of their having succeeded, and there is hardly any other mode of introducing manufactures into a remote corner.

the pasturing of cattle, the commerce between different counties, and the manufactures of the various articles for which they may have occasion, are tedious processes, compared to fishing. Fish captured at sea, or in lakes or rivers, require no feeding or care. The only trouble necessary is, the catching and the preserving them for use; when they cannot be immediately consumed. In regard to the value of this branch of industry, it is well known that the wealth to be derived from the bosom of the waters, (as in the case of the Firth of Forth for some years past,) is of more importance than from the territorial productions of both the shores. Along a coast also, where neither agriculture nor pasturage can be carried on to advantage, where a single plough is scarcely necessary to till the scanty spots which it is possible to cultivate, (which is the case in much of the more western coasts of Scotland,) a thousand vessels might, every season, be loaded with valuable cargoes extracted from the ocean.

There is, probably, no district in Europe better calculated for carrying on the fisheries, either in point of profit, variety, or extent, than Caithness. No less a number than 45 different sorts of fish are caught, either in the fresh waters belonging to the county, or in the seas by which it is surrounded. The greater part of the cod brought to the London market, are caught at present near the town of Thurso, and the fishing smacks employed to catch them rendezvous at Scrabster Road, in its immediate neighbourhood. But no branch of the fishery is so important as that of herring, whether they are to be cured for domestic and European consumption, as the Dutch herrings are, or to be sent to our West India colonies. On the subject of establishing the Dutch mode of catching and curing herrings, I
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beg to refer to the Appendix, in which will also be inserted a list of the different sorts of fish caught at Thurso and its neighbourhood, and the plan of a company for promoting the herring and cod fisheries on these remote coasts.

4. *Mines.* It is generally admitted that mines constitute the natural wealth of a hilly district, and there is no reason to suppose that the higher parts of Caithness are any exception to the rule. With the view of ascertaining so important a point, and of carrying on so profitable a branch of industry, I prepared, last autumn, the following plan of a mining company, which I hope will soon be carried into effect.

Plan of the Caithness Mining Company.

Several very promising appearances of copper, lead, marble, and burr or mill-stones, having been discovered in the county of Caithness, it is proposed to erect a company, for the purpose of ascertaining their nature and value, and how far it would be attended with profit to work them.

Though this county is situated in the most northerly part of the Island, yet there are many advantages in favour of such an undertaking.

1. There is a great command of water, by which *bushes*, or water runs, might be made at a small expence, and worked at all seasons of the year, during even the driest summers, by which any veins of metals will be discovered at a much less expence than by any other method.

2. There is reason to believe, that the most profitable veins will not probably be far distant from the sea, and though no coal has hitherto been found in the

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county, yet peat abounds almost every where, which would be a great advantage for smelting the ore.

3. This county possesses a great advantage over mining districts in general, which are commonly barren, in consequence of its abounding with provisions, and generally, at reasonable rates, so that works to any extent might be established without any risk of their being interrupted, where they are once set a going, by a scarcity of food; and,

4. The gentlemen of the county seem well inclined to promote the undertaking, in particular one of the principal proprietors, who has agreed to accept of one-tenth part of the profits, for his share, in so far as respects any mines discovered on his estate.

It is proposed that the stock of the company shall be divided into eight shares. The annual meetings to be held either at Newcastle, Alston Moor, or Carlisle, or at Berriedale Inn in Caithness, (which is in the neighbourhood of the mines,) as may be most convenient for the partners. From the advantages which the county possesses of water, &c. the necessary trials may be made for so moderate a sum as from 500*l.* to 800*l.*

The above plan, it is hoped, will be successful in regard to the upper part of the county: as to the lower district, Mr. Headrick, and Mr. Bushby, the mineralogical surveyors, have been sent north by the Barons of the Exchequer in Scotland, to bore for coal at Scrabster, in the neighbourhood of Thurso, on lands belonging to the Crown, where there is a great probability that a very valuable mine of coal will be found, which would be of the most essential importance to all that part of the kingdom. A very promising vein of lead ore has also been discovered on the property of Colonel Williamson, of Banniskirk.

5. *Roads and Bridges.* The means of promoting the improvement of a country are :

1. To ascertain the principles on which such improvements ought to be conducted.

2. To remove any obstacles to those improvements, more especially such as have a tendency to damp the spirit of exertion and enterprize ; and,

3. To grant such public encouragement to improvement as the circumstances of a nation will admit. Some hints regarding the third point will be found at the conclusion of the Paper.

As to the second particular, the obstacles to improvement, it will be readily acknowledged, that none can be more pernicious than any obstruction to communication by the want of roads, in so far as regards inland towns and villages, and the want of harbours for seaport towns. Nor can there be a stronger proof of the justness of these observations, than the present situation of the county of Caithness, which, in consequence of the want of roads, bridges, and harbours, has never been able to reach, notwithstanding some natural advantages in its favour, any considerable degree of improvement. With a view of explaining more fully, the situation of that part of the kingdom, in regard to those essential particulars, I sketched out the following Memorial, which was transmitted from a respectable meeting of the county to his Majesty's ministers, in August 1799.

The Memorial of the Inhabitants of the County of Caithness.

That your Memorialists inhabit the most remote district on the continental part of Scotland, opposite to the Orkney Islands, and suffer many inconveniences from

the distance of their situation from the metropolis, and from the inclemency of a northern climate.

But of all the disadvantages to which they are subjected, the miserable state of the road north from Inverness, which is the principal town in that part of the kingdom, and the want of a regular communication with the more southern parts of the Island, are by far the most prejudicial to them. That the road from Inverness to Thurso, by Dingwall, Tain, Dornock, and Wick, is at present 144 miles in length, with some ferries, and several rivers to cross without bridges, and that the line of the road, in one part, is carried through a very mountainous district; whereas by altering that line, and carrying it, not along the coast side, but through the interior of the country, a road could be made from Inverness to the northern extremity of the Island, shorter than the present, without a hill or a ferry, and in every respect better calculated for a communication with the south.

That the said line of road, in consequence of an Address from the House of Commons to the Crown, has been already examined by Mr. Brown of Elgin, whose survey will be completed in the course of this summer and autumn, from whose reports his Majesty's ministers will be able to judge of the advantages attending the said line of road, and of the expence which it would require to make it.

That your Memorialists observe, with infinite pleasure, that the mode of conveying the mail by coaches has been already extended from Falmouth to Inverness, a distance of 925 miles, and they augur an extension thereof to Thurso, a town at present containing about 2,000 souls, peculiarly well situated for the cod, the herring, and other fisheries; also for carrying on various branches
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of foreign commerce. That establishing so advantageous a system of communication from one end of the kingdom to another, stretching above 1,000 miles, would be unparalleled in any other country, and would do infinite credit to his Majesty's government.

That if the said road of communication were made, and a mail coach established thereon, your Memorialists have every reason to believe, that the public will be amply indemnified for the trouble and expence attending the same, by the rapid progress which will be made in the counties of Ross, Sutherland, and Caithness, in agriculture, manufactures, commerce, and the fisheries, and the consequent increase of the revenue.

That if his Majesty's ministers fortunately approve of the measure thus submitted to their consideration, your Memorialists, in conjunction with the proprietors of Rosshire and Sutherland, will submit a plan to be laid before his Majesty for carrying the same into effect, in as economical a manner as possible, and which they trust will be found entitled to his Majesty's royal approbation.

The above Memorial did not meet with the attention that was expected, at the time when it was transmitted; but some months ago, directions were given by Lord Pelham, Secretary of State for the Home Department, to survey a part of the road in question, which it is to be hoped will lead to the execution of the above plan.

There is every reason also now to hope, from the notice given by a member of the House, (the Right Honourable W. Dundas,) who has entered into this subject with great zeal, and in a manner that does him much credit, that the policy of granting public assistance to these roads, will soon come under the consideration of

Parliament, which renders it unnecessary to enter further into the investigation at present ; indeed, the principle is now pretty generally admitted, that works tending to promote the advantage of the whole community, ought to be done at the expence of that community ; and that settling the remote parts of a kingdom, and opening a communication between these and the more civilized districts, ought to be a peculiar object of attention in every well ordered state*.

6. *Harbours.* It can hardly be questioned, that no commercial country can prosper without good harbours. There are few places where harbours are naturally so perfect as not to require the improvements of art ; and where the assistance of art is necessary, it generally occasions a very considerable expence. But it is, fortunately, unnecessary to dwell upon this point, as Mr. Telford, a respectable and intelligent engineer, in consequence of the orders he has received from the Treasury, has surveyed the harbours on the coast of Caithness, in particular those of Wick, Thurso, and Dunbeath, which are the most essential, and will soon lay before Government an estimate of the expence of making the same. Some public assistance will probably be given for carrying on such important undertakings, in the promoting of which Sir W. Pulteney, and the other members of the British Fishing Society, and Mr. Vansittart, Secretary to the Treasury, have much interested themselves.

7. *New Villages.* The advantages of having villages scattered over a country, are too well known to require any particular elucidation. When properly situated, they

* See Observations on the Scotch Fisheries, by P. White, Esq. printed at Edinburgh, An. 1791, p. 103.

often lay the foundation of large towns and cities, but even in their humbler state they are of infinite service, by collecting a number of useful mechanics and tradesmen together, by furnishing hands to carry on such manufactures as are the most essential in every district; and by acting as a centre, where fairs and markets may be held, or little shops set up, or schools established for the education of the children in the neighbourhood. It is extremely desirable, therefore, that a number of villages should be founded, on different parts of an extensive property: and it is my intention to endeavour to establish three; one at Berriedale, to provide for a number of people who may have been deprived of their usual mode of subsistence, in consequence of the introduction of sheep-farming; another at Sarclett, on the sea-coast, not far from Wick, where there is a tolerable harbour for boats, and where, under the auspices of a near connection, (Captain Brodie of Hopville,) a very important fishery may be carried on. The third village is proposed to be at the Brigend of Halkirk, which is in the centre of a fertile country, where several roads meet together, for the advantage of crossing the bridge over the river Thurso, and where a number of people are likely to find the means of employment.

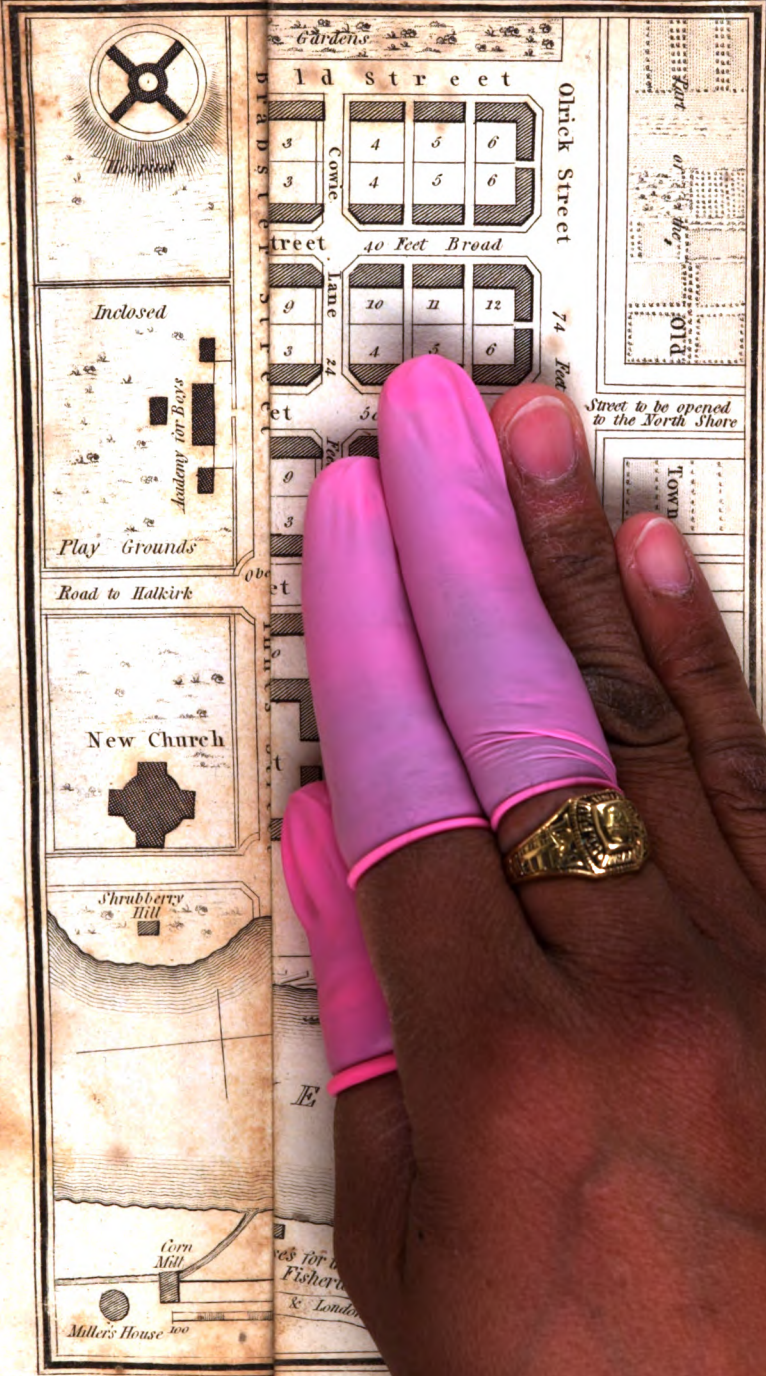
8. *New Towns.* I have ever been of opinion, that no district could reach any great degree of prosperity without having a considerable town erected in it, and that countries are, in general, powerful and prosperous in proportion to the size of the cities which are found in them. Wherever a number of inhabitants are collected together, they become a market for the agricultural productions of the neighbourhood, which, of course, increase with the demand. A large town also, necessarily implies, persons with sufficient capital to promote internal industry,

industry, and to carry on foreign commerce. It also implies establishments for the education of youth, churches for religious instruction, hospitals for the benefit of the sick, institutions for promoting various branches of science, and of art; and other marks of prosperity, civilization, and improvement. On these grounds, I have ever considered the increase of old, or the establishment of new cities, as one of the most striking marks of the flourishing state of a nation.

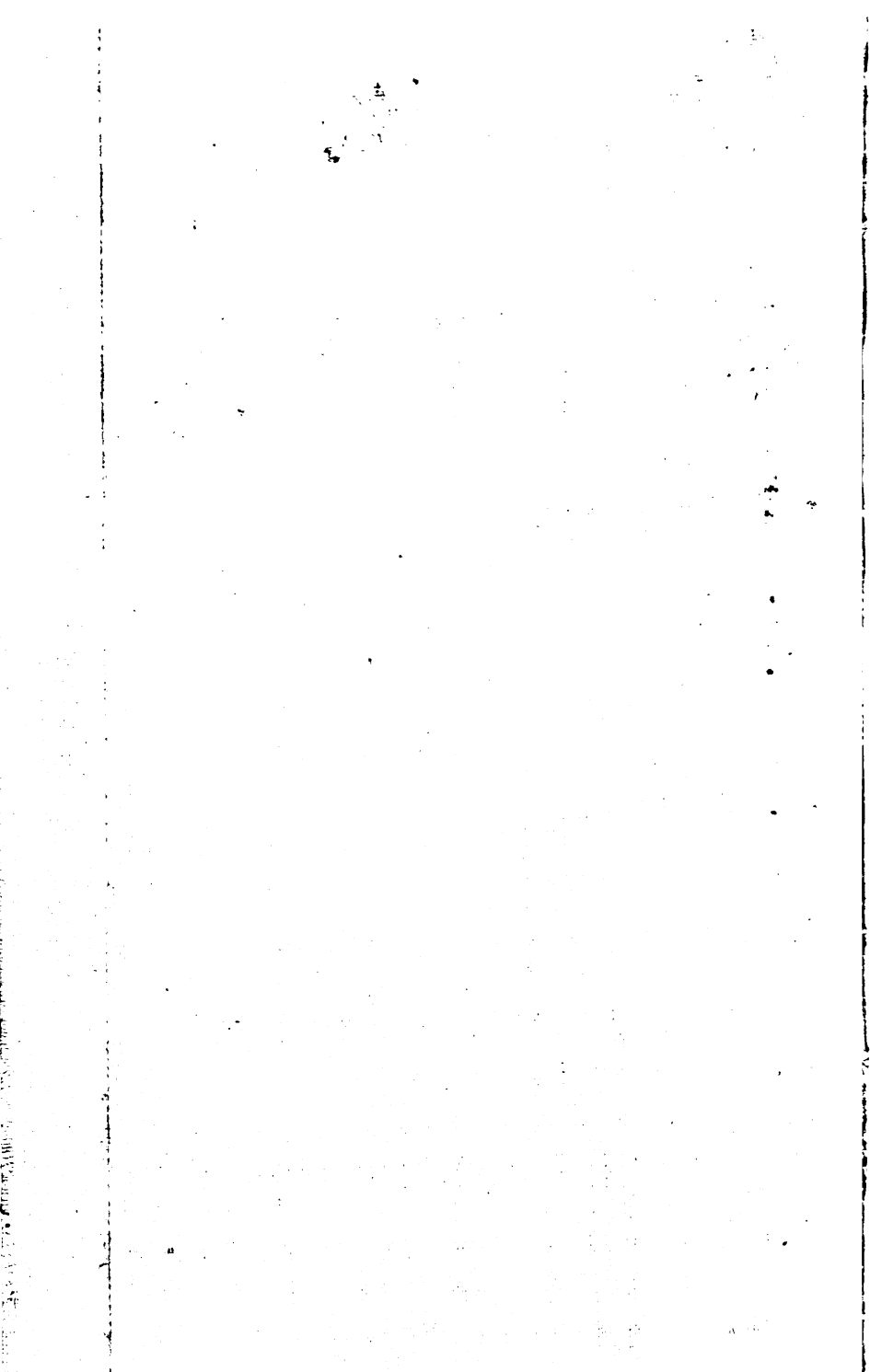
Impressed with these ideas, I was happy to find a town in my own neighbourhood, (Thurso,) admirably situated for every species of improvement. There was an old town which contained about 1,600 inhabitants, but the houses were very irregularly built, and in many places crowded on each other: I was thence induced to resolve on building a new town, on different principles, and where regularity was more to be attended to.

In forming a plan for that purpose, the reader will perceive, from the annexed engraving, (see plate II.) how much the comfortable accommodation of the inhabitants has been attended to, and if that plan is carried into execution in the manner proposed, (which must require time to accomplish,) there is every reason to believe, that, in point of beauty and convenience, it will not be surpassed by any erection of the same extent of which Europe can boast. The new town of Thurso, according to the annexed plan, will only contain about 300 houses; but when a town so advantageously situated is once fairly set a-going, it is impossible to say to what a height of prosperity it may ultimately be carried. Indeed no town can be better situated. It is built on the banks of a considerable river, where it enters a beautiful bay, at the entrance of the Pentland Firth, and opposite to the Orkney Islands. The soil on which it

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The New Town of Thurso is aavigable & near
place can be better calculated according to the most r



is placed is dry, and the new town proposed to be erected, is situated on a gentle slope facing southwards. The harbour, in spring-tides, will, at present, receive vessels of about 100 tons, and when the proposed improvements in it take place, ships of a much larger size may enter. The harbour, it is true, must always be a tide one, but fortunately it has within two miles of it, that celebrated anchorage ground, called Scrabster Roads, which is equal to any of its extent in Europe for security and convenience. No town can be better situated for manufactures or commerce, being within a few hours sail of the German and Atlantic oceans: and commercial exertions are much aided by the accommodation which a branch of the Bank of Scotland, established at Thurso, readily furnishes. The town is admirably situated for the fisheries, that important source of northern wealth; and at present the fishing smacks which supply the London market with cod, being driven from the Dogger Bank, rendezvous in its neighbourhood. Indeed such is the variety of fish in that part of the kingdom, that twenty-four different sorts have been put upon the same table in the course of one day, without any extraordinary exertion. Thurso has also the advantage of excellent sands, where a bathing machine has lately been erected; an academy is now forming; where all the principal branches of education will be taught by proper masters; a boarding-school for girls has been already established, which has been conducted much to the satisfaction of the town and neighbourhood; and as Thurso will thus rival, in the important article of education, any town of its extent in Scotland, that, joined to the cheapness of provisions, and other conveniences, must be a great inducement to persons of moderate incomes to settle there.

In forming the plan of a new town, I thought it extremely desirable to have it laid out, not only in the best manner that my experience could suggest, but also to have the various public buildings necessary to be erected, planned out on the best principles and construction. The private houses are all to be built according to a particular plan laid down for that purpose, and from which no individual who takes the ground is permitted to deviate. Several private houses have been already built; and in the course of this year, (anno 1802,) it is to be hoped that about one-fifth part of the new town will be completed. The general form of that town will be seen from the annexed engraving, plate II. As the public walk is already made, and the bridge built, and as every spot fit for the plough, within sight of either, is inclosed and cultivated, the scene from the public walk, or the bridge, is uncommonly beautiful.

CONCLUSION.

I have thus stated my plan of improving an extensive property, which by many will be considered as visionary and impracticable, but every article of which may be carried into complete effect, if those who are intrusted with the powers of Government in this country are disposed to pay that attention to its internal improvement to which it is so peculiarly well entitled*. In this par-

* The countenance of Government must be of the most essential importance in carrying on all improvements, giving them a kind of ton or fashion: but in a country where so large a proportion of the annual income, arising from the property and the industry of the nation, is exacted by the Exchequer, not only countenance, but even assistance, in so far as regards roads and other means of conveyance, is necessary; and surely the public money cannot be better employed.

particular instance, from the remote and inaccessible situation of Caithness, no great system of improvement can be carried on in that county, unless roads of communication are made, to render it accessible, and harbours are formed, to lay the foundation of extended fisheries and commerce. But if such assistance were given, it would soon appear what might be effected in the remotest corner of the empire. In regard to roads, why might not the army be employed in time of peace, in making such as were the most essential, in districts too poor to form them at their own expence? and as to harbours, the retained seamen, and the marines in particular, might certainly be employed for similar useful purposes, without any detriment to the public service.

It was by encouraging such measures as these that the most celebrated statesman of modern times, justly called Frederick the Great, raised his dominions, notwithstanding great disadvantages of situation, soil, and climate, to that height of prosperity and power to which they attained during his reign. His practice was, to lay out 300,000*l.* sterling *per annum* in promoting public improvement, which he considered “*as manure spread upon the ground to secure an abundant harvest* :” and in fact, instead of being impoverished by such liberal grants, he thereby increased his revenues so much, that he was enabled to leave a treasure behind him, amounting to twelve millions sterling; whereas, this country has been under the fatal necessity of sending to other nations about twelve millions sterling *in one year*, to procure subsistence for its inhabitants! May these considerations make a proper impression upon the minds of those who share in the government of this matchless empire, (*matchless*, indeed, it might be called, were justice done to the spirited and intelligent people by whom

it is inhabited,) and before it be too late, may some effectual steps be taken for encouraging cultivation and improvement, not only for the purpose of preventing what is justly accounted the greatest of all possible calamities, but also with a view of adding to the permanent security and happiness of the people!

LONDON,

25th March, 1802.

APPENDIX.

No. I.

1. *On the Means of establishing the Dutch Mode of catching and of curing Herring*; 2. *On the Variety of Fish caught in the Northern Parts of Scotland*; and, 3. *On the Means of promoting the Fisheries in the North.*

IT cannot be supposed that any exertions on the part of this country can ruin the fisheries of Holland, for the Dutch will probably be able to supply their own markets, and the extensive countries behind them, as cheap as we can do: but without injuring them, we may certainly benefit ourselves; first, by catching herrings in greater quantities than at present; and secondly, by curing them better, so as to give them a better chance for general consumption, both at home and in our colonies abroad. As the means of securing so great an accession of wealth, of subsistence, and of naval power, is a point of the greatest national importance, and for the acquisition of which we have so many natural advantages, I was thence led to collect some information regarding it, of which the following observations is the substance.

For several years past, a herring fishery has been carried on along the coast of Caithness, particularly in the neighbourhood of Wick*, and considerable quantities, (to the extent of from seven to ten thousand barrels *per annum*) have been caught. As there was every reason, however, to believe, that

* Mr. Herbert Marsh, in his examination before the Fishing Committee, gives a decided opinion, that the coast of Caithness is the proper place for carrying on the deep sea fishing.

so important a branch of national industry might be considerably improved, Government, with a laudable attention to the public interest, sent North, last summer, an intelligent engineer, (Mr. Telford,) to survey the coast, and to see what harbours might be necessary for carrying on the fishery on a great scale, and also some Dutch fishermen, in order to ascertain whether their method of catching and of curing herring might not answer in that part of Scotland. I have the pleasure to add, that the result has been in the highest degree satisfactory.

It is to be observed, that herrings appear on the coast of Caithness in the months of June, July, August, and September, when they are in their highest state of perfection, and in such quantities, that were the fishery carried on with spirit, a million of barrels, and even more, might be annually caught. But on the supposition that only half a million of barrels could be got, the importance of such an acquisition to the nation at large, may thus be estimated ;

Number of buffes, at 360 barrels each	-	1,388
Number of men, at 15 men <i>per</i> bufs	-	20,827
Value of the fish, at 1 <i>l.</i> 5 <i>s.</i>	- - -	£.625,000

I. *Harbours.*—For the purpose of securing such important advantages to the country, it is essential that some harbours should be made along the coast.

From Mr. Telford's survey, it will appear what harbours ought to be formed, and the expence of making them : at present, owing to the want of harbours, boats alone can be employed in this fishery ; and, from their size and shape, they can never put to sea but in good weather, and can never be successful, unless the fish are close to the shore, and near the surface. Indeed, whilst this plan is pursued, the quantity caught cannot be much increased, or the quality materially improved.

II. *Buffes.*—If it is intended to prosecute the herring fishing on the northern coast to any extent, it is absolutely necessary that it should be carried on by buffes, there being on the north-eastern coast no deep lochs, or arms of the sea, as on the western

side of the Island, where the herrings take shelter, and where of course they may be caught. Where bufses can be employed, larger and deeper nets can be used; the fishery can be prosecuted almost in any weather, and at any distance from the shore; the fish also, when caught, are less apt to be trampled upon and injured in large vessels than in small. It will also appear, that a better mode of curing them, in particular for home consumption, can be adopted.

III. *Expence of a Bufs, and Outfit.*—The sum it would require to fit out a bufs according to the usage of Holland, cannot be exactly ascertained. The Dutch fishermen at Wick, state the amount in time of war at about 17,000 guelders, or 1,550*l.* sterling, of which 13,000 guelders would be required for the vessel, and the remainder for salt and cask, nets and provision; but in time of peace, half that sum, or about 750*l.* will be sufficient. These vessels have two masts, are lugger built, require from eight to ten feet water, and are generally manned by twelve men and three boys. Instead of being made sharp for fast sailing, they should be bulky and round, which enables them better to stand the sea in tempestuous weather.

IV. *Nets.*—The nets they use in the deep-sea fishery are seventeen fathoms long, and four nets deep, one above another, each net containing seventy meshes, and each mesh about an inch and a half, so that the whole net is about thirty-five feet deep. The nets at present employed on the coast of Caithness are only twenty-two feet deep; consequently the deep nets may catch great quantities, when the others may not get a fish.

V. *Salt and Cask.*—The Dutch use the St. Ubes salt for cod, but Lisbon salt for the herring. Perhaps the Liverpool salt might answer as well, if properly prepared. The barrels are, in general, of the same size with ours, namely, 32 gallons wine measure. They are made of American staves and Dutch hoops, and cost from 4*s.* to 5*s.* per barrel.

VI. *Provisions.*—It is generally supposed, that it is impossible to rival Holland in the herring fishery, on account of the greater cheapness with which the Dutch fishermen are maintained; but this seems to be an error. For breakfast the Dutch-

men have bread, butter, and coffee : at dinner, fresh fish, if they have caught any, and potatoes ; and at supper, pot-barley, treacle, and beer. On Sundays they get beef, and on Thursdays, pork and pease, besides soup. Every morning they get a glass of gin, and two tumblers of white wine on Sundays and Thursdays.

Whatever may be the case with the English fishermen, it is certain that the Scotch do not fare so well, or live so expensively.

VII. *Mode of catching.*—The Dutch fishermen begin the deep-sea fishing on the coast of Shetland on the 24th of June, but on the coast of Caithness, herrings are found on the 1st of June ; and the fishery might begin even a fortnight earlier, if wished for, which is greatly in favour of the Wick fishery. The process of catching is as follows : In the month of July, which is the prime part of the season, if a number of vessels are fishing together, the nets are put out between two and three o'clock in the afternoon, the vessel then lies to with the sails down, and the nets are hauled about one o'clock in the morning. Whereas, according to the practice in Caithness, the boats go about sunset, and return next morning, seldom delivering their cargo till ten or twelve o'clock, when, at that season of the year, the fish must be greatly injured by the influence of the sun, and this renders more salt necessary to prevent putrefaction. By the Caithness mode of catching, the process of curing also is carried on not only in the open air, but often in sunshine.

VIII. *Mode of curing.*—As soon as the Dutch fishermen get the herring on board, they are immediately put in vats in the hold, and gutted as soon as possible, with a small knife, and not with the fingers, as practised in Caithness. When gutted, they are *rouzed* or sprinkled with salt in a kind of vat, and immediately afterwards salted in a barrel. The Dutch use much less salt than the Caithness fishermen, one barrel of salt being reckoned sufficient to *rouze* eleven barrels of herring, and another barrel will cure from six to seven barrels of fish for home consumption ; whereas in Caithness, they generally use one barrel of salt to two barrels of herring, more especially if cured

cured for a foreign market. The mode of packing the fish also varies a little. The fish thus cured are not repacked, but when the bufs arrives in Holland, the barrels are opened, and another row of herring put in, with a little falt, in which state they are fold.

IX. *Consumption.*—In Holland, the herrings thus prepared, are eaten raw, and are reckoned not only a great delicacy, but of use as medicine. The Dutch say, “*When the herring comes in, the doctor goes out* *.” The consumption is very great in Germany, and all over the northern parts of Europe, and would increase, with the quantity that could be got at a reasonable price; indeed there could not be a more acceptable or more useful article in all the countries bordering on the Baltic, than a supply of Dutch herring at a reasonable price. If the herrings are intended for the West India market, more falt is necessary, and the fish must be repacked.

X. *Alterations in the existing laws.*—It is proper to observe, that some alterations must be made in the existing laws for the encouragement of the British fishery, if the Dutch system is to be adopted; for, in the first place, herring are not entitled to the bounty of 2*s.* per barrel, unless they are repacked, which is directly contrary to the Dutch practice; and in the second place, the barrels must be *daunted*, or packed with the feet, which would crush and greatly disfigure fish thus delicately cured. The duty on staves also ought to be taken away; and, above all, the tax on falt entirely abolished, otherwise every other encouragement will be in vain.

Conclusion.—It would appear from the preceding observations, what an important source of national wealth, of food,

* I understand from the most respectable authority, that salted herring, delicately cured, being thrown into the stomach when quite empty, and liquid of every kind abstained for some hours, is a sovereign remedy for chronical indigestion, and this, it is believed, is so generally known, that it is unnecessary to support it by particular proofs. It is to be observed, however, that the saliva ought to be swallowed, and not ejected, which there is a considerable inclination to do in this treatment, as it has a great tendency to call forth the gastric juices. One of the best modes of using salt herring is, as a Sandwich, instead of anchovy.

and naval strength, might be secured to Great Britain, were wise and vigorous measures pursued for that purpose; and this, it may be proper to add, is the fit time to bring that object to bear, when, from the convulsions on the Continent, and particularly in Holland, so many industrious persons, conversant in the herring and in the other fisheries, may be desirous of sheltering themselves from revolutionary storms in these kingdoms, and if settled here, will be happy to furnish this country with all the benefit of their skill and experience.

2. *List of the different kinds of Fish caught in the Neighbourhood of Thurso.*

<i>Sea Fish.</i>		
1 Cod.		24 Dog Fish.
2 Rock, or Redware Cod.		25 Crowners.
3 Ling.		26 Horse Fish.
4 Turbot.		27 Bristles.
5 Hollybut.		28 Sword Fish.
6 Skate.		29 Lythes.
7 Tusk.		30 Sprats.
8 Haddocks.		<i>Shell Fish.</i>
9 Whittings.		31 Lobsters.
10 Herrings.		32 Partans.
11 Mackerel.		33 Crabs.
12 Sea Carp, or Barbadoes Haddock.		34 Spout Fish.
13 Sea Perch, or Millards.		35 Cockels.
14 Sellocks.		36 Perywinkles.
15 Pillocks.		37 Limpetts.
16 Cuddings.		38 Shrimps*.
17 Seaths.		<i>Fresh Water Fish.</i>
18 Cole Fish.		39 Salmon.
19 Flounders.		40 Salmon Trout.
20 Sea Eels.		41. River Trout.
21 Sand Eels.		42 Red Loch Trout.
22 Paidles or Runkas's.		43 White Loch Trout.
23 Catt Mars.		44 Fresh-water Eels.
		45 Fresh-water Flounders.

* Oysters are not found in Caithness, but may be had from the neighbouring counties of Orkney or Sutherland.

It is probable that a greater variety of fish are no where to be met with ; and it is much to be regretted, that we have not hitherto availed ourselves of such important resources to the extent that might be attainable.

3. *On the Means of promoting the Fisheries in the North.*

There can be no doubt that the northern and western coasts of Scotland contain the greatest treasures of valuable fish to be any where met with ; and it is to be hoped that every means will be taken to secure to ourselves so important a source of subsistence, wealth, and naval power. Among other measures calculated for that purpose, the following may be worth consideration.

It is now ascertained, that herrings can be cured in Caithness equal to the Dutch, and can be had in any quantities. When the harbours, therefore, on that coast are made, (which it is to be hoped will soon be the case,) the only two points wanted will be, 1. Capital to carry on the fishery ; and, 2. A market for consumption.

1. In regard to capital, it is proposed, that, after making the harbours at Wick and Thurso and the creeks in the neighbourhood, the capital of the British Fishing Society shall be employed, not in carrying on the fishery, which would be attended with great risk of loss and embezzlement, but shall be lent on good security, at a reasonable interest, to skilful merchants who will carry it on, or shall be employed in purchasing salt or cask, to be sold to the adventurers, every facility being given to the Society, by Government, for that purpose*.

2. As

* Some have recommended the establishment of a great repository in the most convenient situation in the river Thames, like the *Dutch herring yards* at Amsterdam, (where from 50,000 to 100,000 barrels were often to be seen,) for the purpose of examining the fish, putting them into good order for exportation, and where our West Indian and other merchants might be supplied with any quantity for which they might have occasion, and of a quality on which they might rely ; and this is a measure that may be entitled to further consideration.

2. As to a market, it must in a great measure depend upon the manner in which the article is cured. The consumption at home, and in all the European markets, would be greatly increased, were the fish cured according to the Dutch method; and nothing prevents a much greater demand than the British fisheries could well supply, from our West Indian colonies, except that our herrings are not cured in such a manner as to render them fit for so distant a voyage.

The following Certificate, subscribed by some of the best judges of the quality of well cured herrings in London, will prove to what perfection the art of curing herrings has been very lately brought in Caithness.

“ We, the undersigned, do hereby certify, that we have
 “ tasted of a barrel of herrings sent by Sir John
 “ Sinclair to Mr. Falck, which were cured at
 “ Wick, in Caithness, according to the Dutch
 “ mode, and that we find the same herrings re-
 “ semble so much in quality the Dutch herring,
 “ that we could not perceive any material diffe-
 “ rence.”

LONDON, 1st May, 1802.

No. II.

Some Account of the Encouragement given by Frederick the Great, King of Prussia, for promoting the internal Improvement of his Dominions.

The immortal Frederick of Prussia, has long been justly celebrated as a politician and a warrior; but it is not so gene-

tion. Perhaps the Dock Companies might have no objection to build proper repositories for containing herring and other fish, which would be a great inducement to vessels of various descriptions to frequent their docks.

rally

rally known that he was the greatest friend to the internal improvement of a country that perhaps ever governed any state. In this important branch of policy, he principally followed the advice of the great Hertzberg, from whose memoirs the following particulars are extracted.

On the importance of agriculture in general, we find, in these Memoirs, the following interesting observations.

The prosperity, the happiness, and the resources of a great nation, consist indisputably, in the multiplicity, the quantity, and the good quality of those means by which such nation can procure, in the first instance, the necessaries, and afterwards, the conveniencies of life.

As corn, and all kinds of grain, furnish certain food and subsistence to numerous inhabitants, (fisheries only supplying small districts) *agriculture* is incontestably the source, and positive basis of subsistence for a great and populous country; since it furnishes grain of every kind for the support of man and beast, as well as wine, beer, oil, timber, &c.

Agriculture also furnishes flax, hemp, wool, silk, and every thing necessary for the raiment, and other comforts of life; and all the principal ingredients for manufacture, navigation, and commerce. By these means, and the barter of its surplus, it acquires gold and silver; which last, though without intrinsic value, has been received amongst all civilized nations as the sign and representation of wealth.

Agriculture not only maintains the labourer and the husbandman, but likewise every other class of individuals, not engaged therein, but employed in any other calling, or profession, whether civil or military.

Agriculture is then the grand staple and basis of prosperity in all states; and this principle has prevailed to such a degree for some time in France, that a set of ingenious agriculturists, to whom the lofty title of *Economists*, or *Physocrates*, has been given, more conversant, perhaps, in theory than in practice, have made every effort in their power to obtain, for *agriculture*, the chief and sole favour of government, particularly by a free exportation of corn, yet laying on *agriculture*, almost exclusively, the burthen of taxes. The impropriety of this principle

was soon discovered on more mature reflection; for a wise government, though it gives equal attention to *national industry*, will not exempt it generally from national burthens. This is, doubtless, the second basis of the prosperity of states, since it gives the utmost value to the natural productions of a country, as well as the labour and ingenuity of individuals, with a considerable greater profit to those thus employed, than what is got by labourers who till the land. It is such labour, as Smith has admirably proved, which constitutes the true criterion, and universal estimation of all merchandize and riches; and money is only the token, for all productions, artificial and natural, are the result of the labour of individuals, to support themselves, and dispose of their surplus. The result of which is, that *the labour of individuals*, and *national industry*, which form the second basis of *national prosperity*, may, on certain occasions, *supply the place of agriculture*. Thus the French, with an inconsiderable portion of agriculture, have, for above a century, rendered all the nations of Europe tributary to their ingenuity, invention, and labour, in mechanic arts*. Have not the Dutch, with a miserable barren soil, yielding a small portion of what is wanting for themselves, carried on an universal trade and navigation throughout Europe, and availing themselves of the indolence of their neighbours, furnished them with their wants, even such as the Dutch themselves did not possess? Have not the Spaniards, with all their silver, been, at times, in want of bread? Thus Poland, a fruitful country, abounding in corn, the result of agriculture, for want of national industry, is bereft of many other conveniencies of life. All these premises leave not the least doubt on the general principle, that the primary basis and prosperity of a state, and its most certain riches, consist in a *well-directed agriculture*, and abundance of natural productions; and the second basis depends upon *national industry*, giving by labour a value to natural productions, and by ingenuity and application, a still greater value to manual arts and manufactures.

* Great Britain has since enjoyed the same advantage, of which France, under the administration of Colbert, claimed almost the exclusive possession.

Impressed with such ideas as these, Count Hertzberg informs us, that the sovereigns of Prussia granted the following sums for the cultivation of wastes, draining of bogs, the embanking of rivers, and other objects of internal improvement.

Grants in 1782.

	<i>Crowns.</i>
For cultivating wastes, building cottages, and other dwellings for husbandmen, in different villages of the Electoral Marche of Brandenburg	200,000*
For embanking the river Warta	16,000
For introducing 156 new families of settlers in the new Marche	24,000
For introducing 162 new families in Pomerania	25,000
Granted to the nobility and gentry, for the improvement of agriculture, and cultivation of wastes in that district	175,000
For the improvement of agriculture in West Prussia	65,000
For introducing new settlers there from Swabia	90,000
For draining a bog, named <i>Fiemar Brack</i> , in the duchy of Magdeburg, containing 30,000 <i>arpens</i> ,	

* *The following Table will shew the Value of German Crowns, as stated in Count Hertzberg's Reports, reduced to English Money, by calculating the German Crown of one Florin and a Half Value, at the Sum of Three Shillings Sterling, which is a moderate Rate.*

1,000	-	German Crowns, equal to	-	£. 150	0	0	sterling.
2,000	-	-	-	300	0	0	
3,000	-	-	-	450	0	0	
4,000	-	-	-	600	0	0	
5,000	-	-	-	750	0	0	
6,000	-	-	-	900	0	0	
7,000	-	-	-	1,050	0	0	
8,000	-	-	-	1,200	0	0	
9,000	-	-	-	1,350	0	0	
10,000	-	-	-	1,500	0	0	
20,000	-	-	-	3,000	0	0	
40,000	-	-	-	6,000	0	0	
80,000	-	-	-	12,000	0	0	
100,000	-	-	-	15,000	0	0	
200,000	-	-	-	30,000	0	0	

	<i>Crowns.</i>
belonging to different proprietors, and which now produces an annual revenue of 28,000 crowns	190,000
For draining several marshes near the rivers Stemme and Tanger, of which 27,000 <i>arpens</i> were drained, now yielding an annual rental of 17,000 crowns	134,000
For clearing wastes, building villages, &c. in Silesia	88,000
The above, selected from the general statement of benevolent grants of his Prussian Majesty in 1782, amounting altogether to the great sum of 2,118,000 crowns.	

Grants in favour of Agriculture in 1784.

For cultivating 44,000 <i>arpens</i> of waste land, in the country of Brandenburg, and building 336 houses for the silk manufactory	200,000
Granted to farmers, to repair damages done by the inundations of the Elbe and the Oder	58,000
For internal improvements in different bailliwicks near the river Warte	100,000
For repairs of damages by inundations	36,000
Granted to several gentlemen for the cultivation and improvement of land, and other objects of internal improvement in Pomerania	218,000
For new settlers in West Prussia	200,000
Repairs after inundations	66,000
Granted in behalf of individuals under casual misfortunes	80,000
For new settlers in the duchy of Magdeburg	11,500
For carriages to bring provisions to the markets at Berlin	13,000
Rebuilding the cities of Wohlaw, Gronberg, Schobus, and Griffinberg, in the duchy of Silesia, which had suffered by fire	55,000
Building of cottages	10,000
Repairs after inundations	72,000

Recapitulation

Recapitulation of Grants in favour of Agriculture and Internal Improvement from 1763 to 1784.

Time had not hitherto permitted me, (says the Count de Hertzberg) to make the proper search amongst the archives, to verify what I advanced in my dissertation delivered in the Royal Academy last year; that the King had expended, in extraordinary grants to his subjects, in different provinces, since the peace of Hubertsbourg, that is, from 1763 till 1783, the sum of *two millions* of crowns annually, and consequently the sum of *forty millions of crowns* (or six millions sterling) in the course of twenty years: But I can now lay before the public the particulars of the sums granted each year to Pomerania, and the New Marche, and which amounted in all, from 1763 to 1784, for

	<i>Crowns.</i>
Pomerania - - - - -	4,828,000
The New Marche - - - - -	3,002,000

Duchy of Pomerania.

1763. Rebuilding 1,200 houses, granaries, stables, &c. destroyed by the war - - -	1,307,000
Distributed among the inhabitants, 1,200 horses, 374,000 bushels of flour, rye, barley, and oats - - - - -	444,000
1764. Expended for the introduction of 250 families of foreign weavers - - -	22,000
1769. For draining a part of the famous lake of Madue, which, alone in Germany, contained the celebrated <i>murenæ</i> of the Romans, and by which 14,000 <i>arpens</i> of arable and meadow land have been obtained - - - - -	36,000
1770. Granted to the noblesse of Pomerania, for the improvement of their lands - - -	380,000

1771.

	<i>Crowns.</i>
1771. Given to the inhabitants of Pomerania, at a period of scarcity, 72,000 bushels of rye	120,000
For draining of bogs and meadows, on the banks of the river Plane, and introducing 150 families of new settlers	40,000
For draining a lake in the island of Ufedom, given to thirty families of new settlers	10,000
1772. Grant to the nobleffe for improving their estates	370,000
1773. Grant for the same agricultural purpose	200,000
1774. Grant for the same purpose	100,000
1775. Grant for the same	145,000
1776. Grant for the same	150,000
1777. For draining the marshes of Schmolfin and Canain	200,000
1779. For improving the lands of the nobleffe, and draining marshes near the river Ihra	100,000
1780. For improving the lands of the nobleffe	200,000
1781. For ditto	200,000
1782. For ditto	200,000
1783. For ditto	200,000
Including various internal improvements, and building cottages for labourers.	
1784. Grant for improving of agriculture, on the estates of the nobleffe, and building cottages	200,000

Grants in the New Marche, in favour of Agriculture.

1763. Internal improvements in the bailliwicks of the crown, and other crown lands	32,000
1768. In favour of agriculture on the estates of the nobleffe in the New Marche	300,000
1771. For the same agricultural purposes	100,000
1776. For ditto	100,000
1777. For ditto	200,000
	1780.

				<i>Crowns.</i>
1780.	For ditto	-	-	80,000
1782.	For ditto	-	-	100,000
1783.	For ditto	-	-	100,000
1784.	For ditto	-	-	100,000

Besides these grants to the New Marche, the King has expended a million of crowns to embank the rivers Netze and Warte, by which means 50,000 *arpens* of land have been restored to agriculture, consisting of excellent soil and good meadow, and where there is now a numerous colony of new settlers.

With respect to the grants in favour of agriculture, on the estates of the noblesse of the New Marche, those sums were granted by way of gift, on their paying 1*l.* or 2*l.* per cent. interest, which money was appropriated for some officers' widows, and salaries to schoolmasters.

Premiums for the Abolition of Commons.

Frederick the Great also rendered great service to agriculture, by authorising and encouraging, even by premiums, the abolition of Commons, and separating arable land from pasturage, by which an individual proprietor may reap much greater advantage than if he held such right in common with others. These arrangements, though very difficult, have nevertheless been effected in hundreds of villages, and are continued every year.

Grants in favour of Agriculture in 1785.

For different improvements in agriculture, and draining the great bog of Dromling, in the Electoral Marche of Brandenburg	-	-	-	200,000
For improving the estates of the noblesse, and other agricultural purposes there	-	-	-	100,000
For repairing damages caused by inundations there				40,000
For internal improvements in agriculture, and in free lands belonging to the city of New Stettin, in Pomerania	-	-	-	200,000
For internal improvement in different bailliwicks in East and West Prussia	-	-	-	100,000
				For

	<i>Crowns.</i>
For new settlers from Swabia - -	40,000
For repairing damages, caused by inundations, in the duchy of Magdeburg - - -	60,000
In different grants for damages arising from inundations, and in other devastations to unfortunate husbandmen, and others, in Westphalia and East Friezeland - - - -	213,726
For the settlement of 364 labourers in Silesia	36,830
Internal improvements in the lordship of Prockau	13,770

Prussian Grants for Agriculture and Internal Improvement in 1786.

Farther grants towards draining the great lake of Drommeling, in the Old Marche - -	200,000
For corn distributed amongst poor labourers in want of bread, on account of the inundations -	34,000
To the same distressed people in summer seeds	21,000
For expences of importing Spanish sheep -	22,000
To the poor distressed parishioners of the German and French churches in Berlin, for fuel -	20,000
For bread, distributed amongst distressed husbandmen, in the New Marche - - -	4,800
To the same, for summer seeds - .	4,596
For the better cultivation of land, trefoil, lucerne, and buildings for the silk manufactory, in Pomerania - - - -	100,000
For summer seeds to such farmers who were in want of them in that province - -	19,000
For internal improvements in the bailliwicks of West Prussia - - - -	100,000
Grant in favour of labourers and emigrants from Swabia - - - -	40,000
Grant in favour of farmers who had suffered from storms and tempestuous weather - -	6,000
Grant for new buildings for cottagers and labourers in Silesia - - - -	22,000

The

The above, independently of a variety of other grants, amounting to 1,901,756 for internal improvement in different provinces; and besides a grant in 1785 of 1,000,000 of crowns, to repair the infinite damages caused by inundations in the Marche of Brandenburg in Silesia, and in Pomerania; so that the sum total of grants in favour of the Prussian dominions, amounted altogether in the year 1786, to the sum of 2,901,756 crowns.

Grants in favour of Agriculture and Internal Improvements, by the late King of Prussia, Anno 1787.

	<i>Crowns.</i>
Grant for 20,000 bushels of wheat, given to distressed individuals, ruined by inundations -	18,000
For sums granted to individuals for divers improvements in the country, in the Electoral Marche	40,000
For internal improvements on the new drained lands on the banks of the Oder and of the Warte, in the New Marche - - - - -	80,000
Granted for fundry improvements on the lands of husbandmen, in Pomerania, and in the New Marche - - - - -	200,000
Granted in favour of different villages, to repair damages sustained by inundations in the neighbourhood of Marienbourg - - - - -	6,000
For internal improvements, and for the canal of Bromberg - - - - -	238,000
For improvement of the lands in Magdeburg, &c.	109,800
For internal improvements, and to repair damages suffered by inundations in Silesia - -	83,100

All the above grants are exclusive of many others, for building bridges, repairing churches, roads, schools, and masters, &c. &c.

The whole amounting altogether to the sum of 525,700 crowns, for the year 1787.

Remarks of Count Hertzberg.

From the grants of 1782 it will appear, that his Prussian Majesty laid out the sum of 2,118,000 crowns in specie, in divers grants of a benevolent nature, in favour of his subjects, without increasing the usual taxes, and without any retribution.

The branch of mineralogy, hardly known in 1768, has been so advantageously improved, that the Prussians now export to the value of 234,000 crowns, which makes a saving to the amount of 500,000 crowns, no longer necessary to expend abroad for iron, copper, lead, cobalt, vitriol, alum, coals, &c.

New coal mines have been opened in Silesia, and in the county of Lamark: a great market has offered for them in Holland, since the river Buhr has been made navigable.

It is unnecessary to enter into numerous details, relating to the encouragement given to plantations: also to artificial meadows and a variety of other branches of general industry, promoted and encouraged with the utmost benevolence and judgment.

Grants from 2d June 1787, to 1st June 1788.

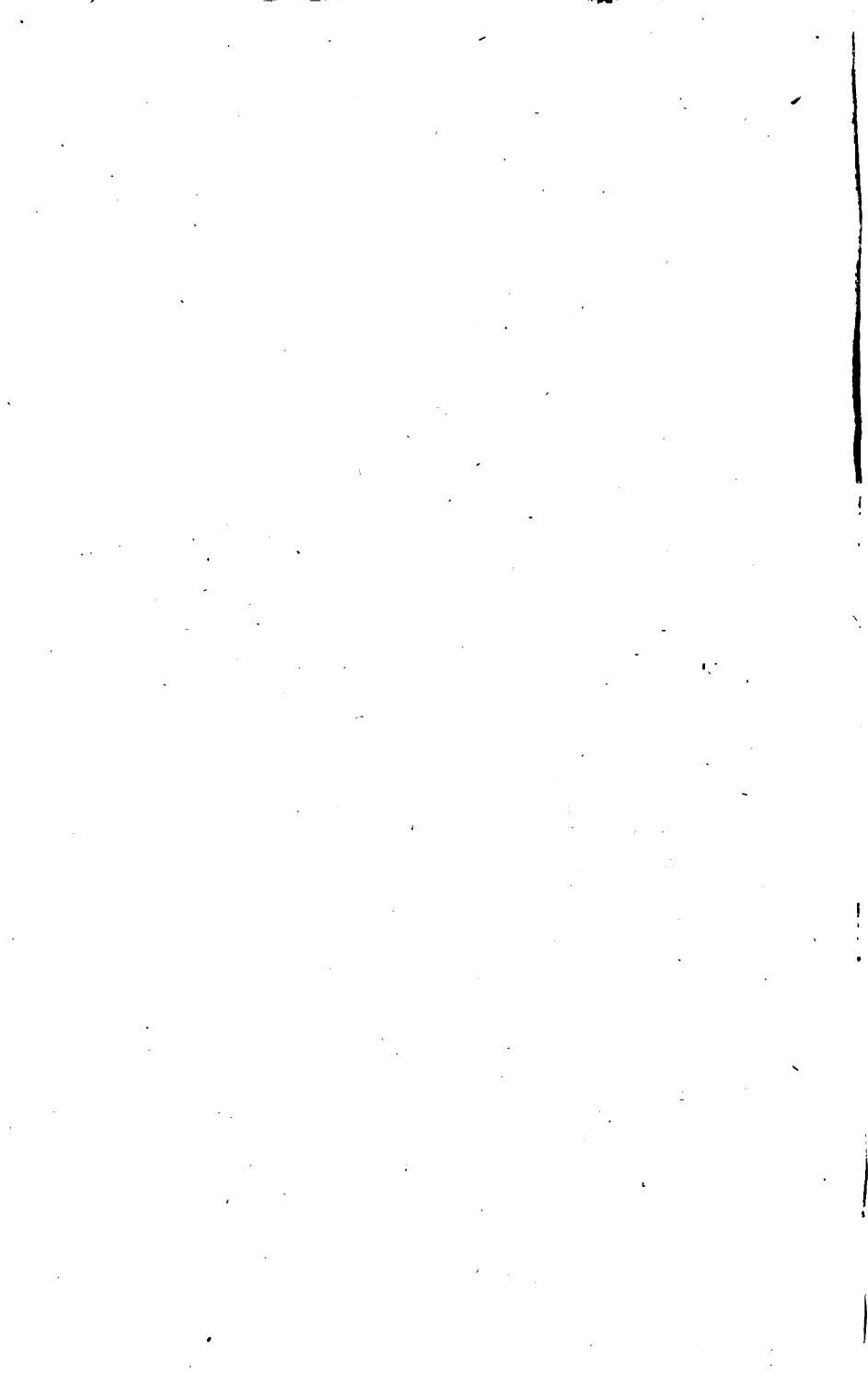
The under-mentioned grants are deducted from the general mass of extra grants in the period above-mentioned, amounting to the sum of 2,632,500 crowns, in favour of the people, and taken from the surplus of the revenue of the state, so as not to injure the annual expenditure, or the national treasury.

	<i>Crowns.</i>
For improvement of the lands belonging to the nobility of the Electoral Marche	108,000
For making a canal for the conveying of peat from Linum	20,000
For repairing the banks of the Oder and Warta, damaged by inundations	60,000
Internal improvements in Pomerania, and in the New Marche	90,000
	Buildings

	<i>Crowns.</i>
Buildings and reparations in sundry bailliwicks -	15,000
Internal improvements in East and West Prussia	100,000
Sundry improvements in West Prussia, - -	20,000
Sundry internal improvements in Westphalia -	40,000
Granted in favour of husbandmen, who had suffered from a hail-storm in Silesia - - -	5,700
Similar grant in favour of sufferers by inundations	6,000
Similar grant to enable sufferers to buy corn -	3,200
For embankments on the Oder, and making dykes	14,400

Grants in 1789 in favour of Agriculture.

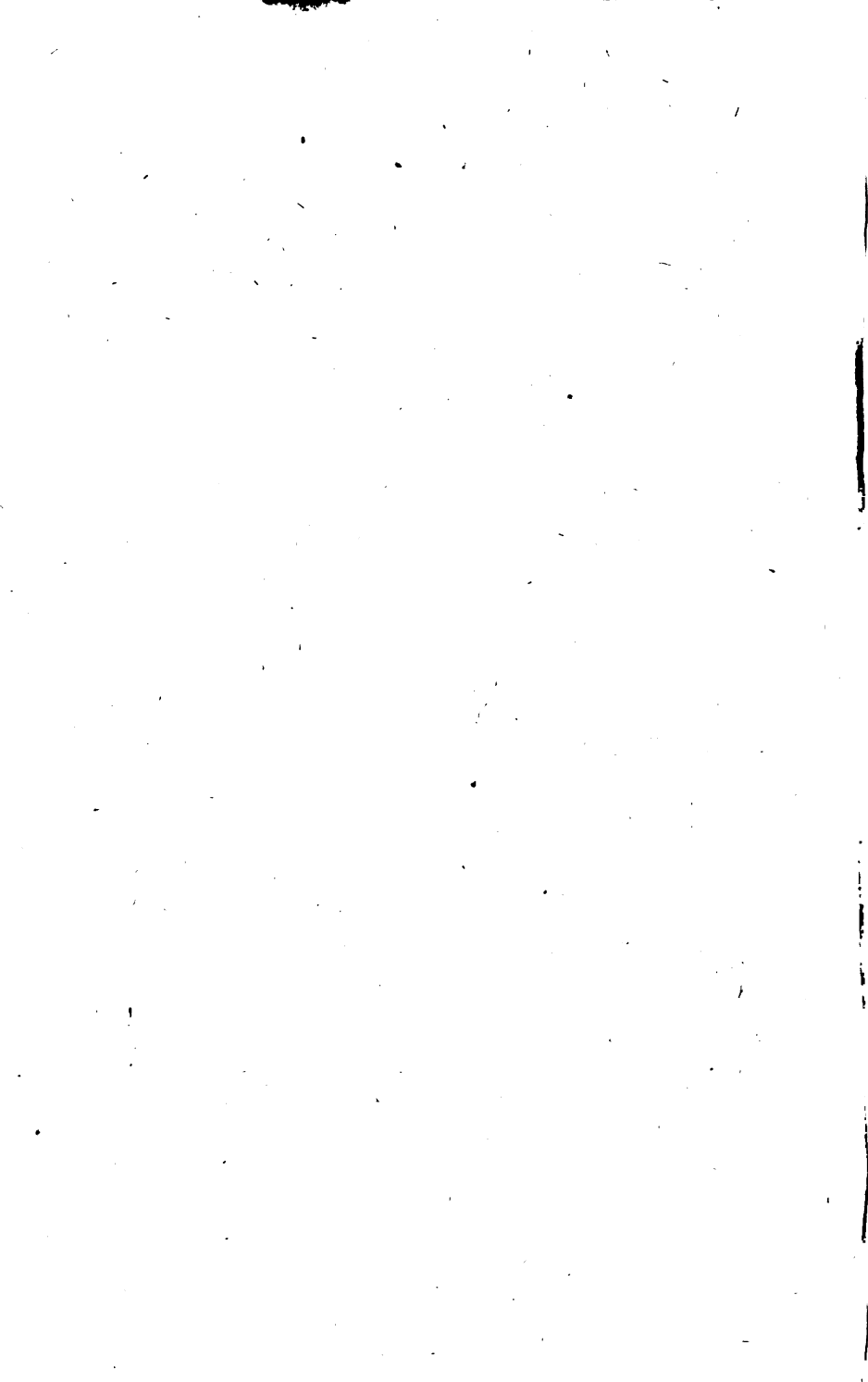
For improvements of lands - - - -	100,000
For a mill to grind madder, at Howensmow -	1,000
Repairs on the banks of the Oder and Warte, in the New Marche - - - -	60,000
For improving the lands in Pomerania and the New Marche - - - - -	100,000
Internal improvements - - - -	12,000
For improving the lands in East and West Prussia	79,900
Repairs on the roads, and on the banks of the Weser	28,000
Granted for encouraging the culture of flax -	10,000
	<hr/>
Granted in 1789 - - -	Crowns 390,900



ESSAY IX.

A C C O U N T
OF THE
O R I G I N
OF THE
BOARD OF AGRICULTURE,
AND
ITS PROGRESS
FOR THREE YEARS AFTER ITS ESTABLISHMENT.

[*ORIGINALLY DRAWN UP AN. 1796.*]



ESSAY IX.

ACCOUNT OF THE ORIGIN OF THE BOARD OF AGRICULTURE.

[ORIGINALLY DRAWN UP AN. 1796.]

THE circumstances which led to the establishment of a Board, so likely to be of material service, both to this country, and to society at large, cannot fail to be interesting, not only to the Members of that Board, but to the Public. It appears, therefore, a duty incumbent on the person by whom that institution was proposed, to draw up a brief account of the various circumstances which contributed to its formation, whilst they continue in his remembrance. To trace the steps whence useful establishments originated, is at all times desirable and useful; but it is, perhaps necessary, on the present occasion, as some have supposed, that the idea of such a Board was borrowed from this or that author, who incidentally might have previously suggested plans of a similar kind. Had it been so, I should have readily acknowledged it; for the difficulty attending such an attempt, is, not to propose a plan, but to carry it into execution*. It may be sufficient, however, to declare,

* In modern times, it is impossible to claim any particular merit from such suggestions; for all *Societies* instituted for the improvement of any particular branch of science, are merely extensions of the idea, which was carried into effect, when the Royal Society was instituted in 1662; and all *Boards* are derived from the Board of Trade, established in the reign of King William.

that I knew nothing of such a measure having been recommended by any other individual, previously to its having been proposed by myself. Indeed, from the following narrative, the reader will easily perceive, that such an idea would naturally have occurred to the person who moved it in parliament, independently of any suggestion from others.

In the year 1786, I undertook an extensive journey through the northern, and, with respect to useful information, undoubtedly the most interesting part of Europe. The object of that tour was, to obtain political knowledge, to ascertain the state of other countries, and to discover every means, which had been sanctioned by the experience of other nations, that could be successfully introduced for the improvement of Great Britain. In the course of that tour, I became acquainted with the most distinguished authors, the ablest statesmen, and the most zealous patriots, that Europe could then boast of. I returned, full of ardour, to establish, in my own country, all the beneficial institutions which were scattered over others; and to make this island the centre of the various improvements of which political society was capable, more especially those of an agricultural nature, to which a person possessed of landed property is naturally partial. But circumstances, on which it is unnecessary now to dwell, having occasioned a coldness with the Minister, I found that any attempt to carry such measures into effect was not likely to be successful in parliament, and thence was under the disagreeable necessity of giving up such ideas for a time, and of waiting for a more favourable period to bring them forward.

As, however, in the course of my tour, I necessarily collected a variety of useful hints, and was enabled to ascertain

ascertain that much might be effected by the exertions of one man, if uninterruptedly devoted to any particular object* ; as in the course of that tour, I found the superior importance of agricultural pursuits, the great character which England had acquired for knowledge in that art, and the expectations which were entertained that it would be peculiarly improved in this country, universally admitted ; and as the extent of the tour, and the rapidity with which it was executed, renders it at any rate an event worthy of preservation, I have taken the liberty of subjoining a note, in which the principal particulars of that journey are detailed †.

The next circumstance which led to the establishment of this institution was the following :

In the year 1790, I laid before the public the second volume of the History of the Public Revenue of the

* It was this circumstance which induced me, from the beginning, to carry on the business of the Board, on a greater scale than otherwise I should have attempted, and which to any other person, not possessed of equal experience in conducting political inquiries, would have been deemed impracticable.

† ABSTRACT OF THE JOURNEY.

1786. May 29.	left London.	Sept. 23.	arrived at Kiew.
	30. embarked at Gravesend.	Oct. 4.	at Warsaw.
June 16.	landed at Gottenburgh.	17.	at Vienna.
	22. arrived at Copenhagen.	Nov. 8.	at Berlin.
July 11.	at Stockholm.	Dec. 5.	at Amsterdam.
Aug. 1.	at Riga.	23.	at Brussels.
	8. at Petersburgh.	29.	at Paris.
Sept. 10.	at Moscow.	1787. Jan. 16.	at London.

In all about seven months and a half.

The journey amounts to 7,500 English miles, or 33 miles a-day. However short the time may appear, yet it is certainly possible, by great activity and perseverance, even in seven or eight months, to see the objects the best entitled to attention, and the persons the most distinguished for their power, their beauty, or their talents, in the greater, and (what is justly accounted) the most interesting parts of Europe.

British Empire. I had intended, as appears from the advertisement prefixed to that work, to have concluded it with a chapter on the political circumstances of the country; but after taking every possible pains to become master of the subject, all the information I could obtain was so extremely defective, that it was necessary to give up the idea; and I then saw the necessity of forming the plan of some institution for the express purpose of collecting useful political information, the public at large having felt the most serious inconveniences and losses from information of that nature not being any where to be obtained.

Soon after the publication of that work, I visited Scotland. It happened to be about the meeting of the General Assembly of the Clergy of that country, of which assembly I was a member *, and with the leaders of which I lived in terms of intimacy and friendship. It fortunately occurred to me, that I might prevail upon that respectable body to furnish such information respecting the general state of the northern part of the kingdom, as might enable me to give a sufficient idea of the political situation of that part of the British empire. I was thence induced to begin that extensive undertaking, the *Statistical Account of Scotland*, now about to be concluded in 20 volumes octavo. It is a work, concerning which it is only necessary to observe, that towards its completion, NINE HUNDRED individuals of intelligence and ability have contributed their assistance.

* Laymen, under the name of elders, or ruling elders, are admitted members of the clerical judicatures in Scotland; by far the best means of establishing that union so often talked of between church and state.

About the time that work commenced, I had occasion to consult with some of the clergy and the proprietors, of the Shetland islands, who happened then to be at Edinburgh, respecting the best mode of procuring information from that part of the kingdom, and heard such accounts of the celebrated wool of that country, and received such information respecting the danger to which their flocks were exposed, from an infectious disorder which had got into their islands, that I resolved to bring the state of the sheep and wool of the Shetland Islands before the Highland Society. That respectable institution acknowledged the importance of the subject, and gave every possible assistance in prosecuting the necessary inquiries regarding it. But finding that the funds of that Society were too confined for carrying on any measure on a great scale, for the safety of that sort of sheep, or the improvement of the other breeds in the kingdom, more especially as it had a great variety of other objects to which it was bound to direct its attention, I saw the necessity, of erecting a new institution, for the special purpose of improving British wool; in which attempt I fortunately succeeded.

The business of the British Wool Society was carried on with considerable energy and success. It would be tedious here to narrate the particulars. They are to be found in Appendix No. 3, of the corrected Report of Mid-Lothian. In conducting the affairs of that Society, I received additional experience to that which I had already acquired from the Statistical Account of Scotland, of the many important advantages to be derived by procuring accurate reports respecting particular districts. The state of the sheep-farming in the northern parts of Scotland, was ascertained in the course of a tour made by Mr. Andrew Kerr, in 1791; and in

1792, some intelligent persons, residing on the borders of the two kingdoms, were sent to survey the manner in which the farmers in England managed their flocks. When the account of their tour was published, I thought it necessary to prefix some ideas on the means of improving British wool in general; and on that occasion, for the first time, ventured, in the following words, to hint at the establishment of a Board of Agriculture.

“ The British Wool Society, by calling the attention of the public, to the improvement of this important article, have certainly done much service to their country. Under their patronage, the greater part of the island has been surveyed, by persons skilled in the management of sheep, whose observations they are circulating over the kingdom. They have established many important facts; they have proved, that the finest breeds of Spain, or of England, will thrive in the wildest of the Cheviot hills, and that very fine wooled breeds may be propagated in the most mountainous districts of Scotland.—But unless this object is thought worthy of public attention and encouragement,—UNLESS A BOARD OF AGRICULTURE IS CONSTITUTED, for the sole purpose of superintending the improvement of the sheep and wool of the country, and other objects connected, either with the cultivation or with the pasturage of the soil, the exertions of any private society must soon slacken, and its labours become useless and inefficient; whereas, under the protection of the government of the country, and the superintendance of such a Board, properly constituted, (more especially if formed of persons, who *gratuitously* devoted their services, to promote such valuable and truly national interests,) every

“ every field would soon be cultivated to the best advantage, and every species of stock would soon be brought to their greatest possible perfection *.”

Fully impressed with the peculiar importance of the institution thus hinted at, and resolved to wait no longer in the expectation of a more favourable period to propose it, I came up to London in December 1792, determined either to succeed in the attempt, or if unsuccessful, to abandon political pursuits, and to devote myself entirely, in future, to the improvement of my own private estate †.

Being

* See p. 125. Appendix to Essay V.

† I began the attempt with little hopes of success, but with a resolution to try every possible chance of obtaining the object. Little encouragement was given to persevere in it, by those to whom I first mentioned the plan. Mr. Arthur Young in particular assured me, it would be vain to attempt it; and jocosely betted a complete set of his *Annals of Agriculture*, against another set of my *Statistical Account of Scotland*, (a natural enough kind of wager between two literary men,) that it would not succeed. Having accidentally informed Mr. Young, in the course of a letter to him, that I had an appointment with Mr. Pitt, to explain to that Minister the advantages of the proposed measure, that he would certainly lose his *Annals*, and that he ought to send them to the binder's; in his answer, dated 10th January, 1793, he says, “ you are going to Mr. Pitt, and I am to lose the wager: when you come from Mr. Pitt, I shall have won it. Pray don't give ministers more credit than they deserve. In manufactures and commerce you may bet securely; but they never did, and never will do any thing for the plough. Your Board of Agriculture will be in the moon. If on earth, remember I am to be Secretary.” I mention this incident, principally with a view of rescuing this active and valuable friend to the agriculture of his country, from an imputation, that he had sacrificed his political principles, for the sake of the emoluments attached to the situation of Secretary to the new Board. In the first place, till the address passed the House of Commons in May 1793, he did not believe that such an institution would

Being at that time in opposition to the Minister, the prospect of succeeding was not very promising. Several incidents, however, which it is unnecessary now to mention, contributed to its success: the assistance of Mr. Secretary Dundas in particular, was extremely material, who, notwithstanding our political differences, was always well disposed to promote any measures I brought forward, which might appear beneficial to the public. The first sum I required was 10,500*l.*; but I afterwards found it necessary to reduce it to 5,500*l.*, and at last so low as two 2,500*l.* The annual income, however, was at last finally settled at 3000*l.* In Appendix A, the reader will find the copy of a printed paper, which was circulated among the Members of the House of Commons previous to the motion coming on, which I have thought it necessary to preserve, it being the first rough sketch of the plan, and the reader might, perhaps, be desirous of comparing it with the future establishment of the Board.

It was on the 15th of May, 1793, that the motion for an Address to the Crown, recommending such an institution, was made in Parliament. The substance of the speech made upon the occasion will be found in Appendix B. The Chancellor of the Exchequer (Mr. Pitt) immediately before I rose, informed me in private, that he would not oppose the measure, but that his support would depend on what he judged was the

would ever have taken place; and, in the second place, if such a plan should unexpectedly succeed, he applied for the office in question, not to the Minister, but to a private friend, on whom the nomination of Secretary to his own Board, would necessarily devolve. No member of the administration, indeed, interfered in the nomination of any one of the officers.

sense and feelings of the House upon the occasion ; which seemed so decidedly in its favour, that he determined to assist in carrying it through. A few members in the opposition, imagining that some deep plot of the Minister's, or some scheme of corruption or influence, was at the bottom, resisted it with great vehemence ; and from dislike to new schemes, or prejudice against any thing the Government seemed to countenance, would have strangled a measure in its birth, which has already so materially contributed to preserve the nation from the horrors of famine, and will be the means of rapidly increasing its agricultural industry and treasures *. On the first night it was proposed, the House happened to be extremely thin before the business came on, and was actually counted out in consequence of 40 members (the number necessary when a question is to be determined by a division) not being present. The debate was then adjourned till the 17th of May ; and after a discussion, in the course of which many respectable gentlemen spoke in its favour, it was carried, on a division, by a majority of 75 ; 101 voting for it, and 26 against it. It would be injustice to the Minister, not to acknowledge, that all my efforts would have been fruitless, had he not latterly exerted both his influence and his talents in support of the measure.

The motion thus carried, was expressed in the following terms :

“ That an humble Address be presented to his Majesty, entreating that his Majesty would be graciously

* Mr. Sheridan, and some others, who originally opposed it, have since very handsomely expressed their conviction of the utility of the measure, and a wish to see the Board put on a respectable footing.

“ pleased,

“ pleased, to take into his royal consideration, the advantages which might be derived by the public, from the establishment of a Board of Agriculture, and internal improvement.

“ Humbly representing to his Majesty, that though in some particular districts, improved methods of cultivating the soil are practised, yet that, in the greatest part of these kingdoms, the principles of agriculture are not yet sufficiently understood, nor are the implements of husbandry, or the stock of the farmer, brought to that perfection of which they are capable.

“ That his faithful Commons are persuaded, if such an institution were to take place, that such inquiries might be made into the internal state of the country, and a spirit of improvement so effectually encouraged, as must naturally tend to produce many important national benefits, the attainment of which his Majesty has ever shewn a most gracious disposition to promote; and in particular, that such a measure might be the means of uniting a judicious system of husbandry, to the advantages of domestic manufacturing industry, and the benefits of foreign commerce, and consequently of establishing, on the surest and best foundations, the prosperity of his kingdoms.

“ And if his Majesty shall be pleased to direct the institution of such a Board, for a limited time, to assure his Majesty that his faithful Commons will cheerfully defray any expence attending the same, to the amount of a sum not exceeding 3000*l*.”

The difficulties, however, attending the formation of such an establishment, instead of being surmounted, had

had hardly yet begun. I had occasion to make an excursion to Scotland after the motion was carried, but returned in June, full of expectation, that in the space of a few days the Board might be assembled. Yet, though every possible exertion was made, the charter was not drawn up, and ultimately sanctioned by the authority of the Great Seal, till the 23d of August: and it was on the 4th of September following, before the Board could be assembled*. The reader will find in Appendix C, the address that was pronounced on that day; in which the measures recommended to the attention of the new institution, and which have since been pursued, are chalked out. It may not be improper to add, that our regular sittings did not commence till the 23d of January following, only one meeting, for the purpose of constituting the Board, having been held in 1793. Hitherto, therefore, only three sessions have taken place.

By the original plan it was proposed, that *500l. per annum* should be expended in collecting materials for a Statistical Account of England. Specimens of Parochial Reports, exhibiting the progress of political society, from the pastoral state to that of luxury and refinement, which were intended to furnish examples of the proper mode of drawing up such accounts, in districts of every description, were actually printed, with a view of being sent to the clergymen of every parish in England; and an address, explaining the nature and principles of statistical philosophy, was prefixed to those specimens, with a view of rousing the Clergy of the

* In the course of that tiresome interval, I was often on the brink of giving up the attempt; and nothing but a spirit of perseverance, which could not easily be damped, prevented me from relinquishing it.

Church of England to an exertion similar to that of their brethren in Scotland. As it is proper to preserve the hints contained in that address, in case such a measure should be resumed, I have inserted both it, and the papers and tables which accompanied it, in Appendix D. The specimens alluded to, are particularly mentioned in that part of the Appendix, and are to be found in the Statistical Account of Scotland.

But after every measure was thus prepared for carrying on the Statistical Account of England, with the greatest possible energy and spirit, I found it necessary to alter the plan. The want of the privilege of franking, the impossibility of conveying papers by any other medium but the post, to every parish of the kingdom, and doubts how far the public might at first approve of such inquiries, until they had been accustomed to them, and had felt the benefits to be derived from investigations of that nature, all contributed to decide in favour of *general*, instead of *minute and particular*, inquiries. I was therefore under the necessity of recommending, in the address above alluded to, *County* instead of *Parochial* Reports. The plan drawn up for the County Reports, will be found in Appendix E; and in Appendix F, a statement of the manner in which the surveys were arranged. It is singular that such an undertaking should have been attempted by one man *, the Board having delegated to its President the whole charge of those surveys; but it was owing to the following peculiar circumstance.—Being possessed of property in the most remote province of this Island, (the county of Caithness) where I occasionally reside, I am under the

* The correspondence respecting these surveys was particularly extensive. Several thousand letters were written on the occasion.

necessity of traversing a great part of the kingdom in my way to and from the metropolis, and must necessarily be acquainted with a greater variety of individuals than falls to the lot of almost any other person; and thence I found little difficulty in nominating persons capable of giving an account of the husbandry of every part of the kingdom. This was extremely material, in conducting a business where the improvement of the whole, and not the partial benefit of any particular district, was in contemplation. Besides, a complete view of every part of a kingdom is desirable, because there is no spot in it which is not entitled to attention, and from which some useful hints may not be obtained.

In appointing persons for the purpose of drawing up the surveys in question, I was extremely desirous of having as great a variety as possible, in order that no branch of husbandry might be neglected, and that the subject might be viewed in every possible light. Many of those who were nominated on the occasion having undertaken the task gratuitously, and all of them being satisfied with little more than the bare payment of their expences, the whole charge of collecting the great mass of information contained in the original Reports, has not exceeded the inconsiderable sum of about 2,170*l*. The principal expence was that of printing, it being proposed to give copies of the Reports to every member of the two Houses who applied for them. The number of which, however, having soon increased to 501, namely, 375 Commoners, and 126 Peers, the expence amounted to a sum far exceeding the narrow income with which the Board was intrusted, consequently it became necessary to require a subscription of ten guineas from those who wished for the Reports. That the public, however, may see how the money given to the Board

Board has been expended, an account of it will be found in Appendix G, so far as it has hitherto been received.

With regard to the progress of the institution, after it was thus constituted, it may be sufficient to refer the reader to the Addresses printed in the Appendix, H, I, K, in which I have endeavoured briefly to state the measures which have been taken in the course of each session. From the perusal of those papers, it will appear, how great a variety of articles were attended to, and how much important business was gone through within a very limited period.

The original sketches of the County Reports, with only two exceptions, now in the press, are already completed, and even the corrected Reports are at this time in a state of considerable forwardness. But were all the County Reports reprinted, and even the General Report on the Agricultural State of the Kingdom, laid before Parliament, only a small part of the original plan will have been executed. According to that plan, every thing that regarded, not only the agriculture, but *the internal improvement* of the country, was included in the proposed establishment. The object was, first to collect, and then to condense and systematize, every particle of information respecting any point that could be interesting, either to individuals or to society *. It would not then be difficult for any set of rulers to know, how the happiness of the people they governed could best be secured: nor would it be impossible, in a great measure, to realize those schemes of public felicity, with the expectation of which, a neighbouring nation has so often been amused,

* See Appendix L, for a farther explanation of the objects of the Board.

But were it restricted to agriculture alone, its importance to this country, at this time, is hardly to be questioned, more especially as from the magnitude of our debts and expences, an increased, and increasing revenue, is so essentially necessary. When the principles of improved husbandry are once clearly ascertained, (which will soon be effected by the exertions of the Board,) and when, by wise laws, every obstacle to improvement shall be removed, the farmer will then be enabled to raise, at less expence, a much greater quantity of provisions, and consequently will have it in his power, without injury to himself, to sell them at a lower rate to the public.

The people having thus the necessaries of life cheaper, must be better satisfied with the Government under which they live than otherwise they would be, and must have more money to lay out on superfluities, the taxes on which are the principal sources of the public revenue.

Hence, both the peace and quiet of the country, and the resources of the state, depend upon the progress of our agricultural improvements. By them, the industrious and skilful farmer, instead of being injured, may be enriched, though provisions may be cheap and abundant; whilst the public at large, and the Exchequer in particular, reap all the advantages to be derived from the greater plenty, and consequently from the comparative cheapness of provisions; and, what must prove the necessary result of both, the general prosperity of the nation.

It is on this day precisely three years since the Board of Agriculture first assembled. The labour which it has since been necessary to undergo, and the difficulties which have since been surmounted, the reader will easily

perceive, must have been extremely considerable, in conducting a new and extensive undertaking. I have hitherto been enabled to preside over the business of the Board with some degree of satisfaction and success, and my utmost ambition is, to see it put in such a train that it will be almost impossible for any person who may succeed in that situation, to render so valuable an institution either mischievous or useless.

I cannot conclude, without offering my best acknowledgments to the many respectable members who have assisted me in the management of so important an establishment. To their zeal, exertions, and public spirit, the success of the Board, and the character it has acquired, must be attributed. Whilst they continue to honour it with their support, it cannot fail to prove a blessing to their own country, and an example to others.

JOHN SINCLAIR.

BOARD OF AGRICULTURE,
4th Sept. 1796.

APPENDIX. A.

Plan for establishing a Board of Agriculture and internal Improvement.

[ORIGINALLY PRINTED IN MAY, 1793.]

IT has long been justly complained of, that, whilst every attention as been paid to *trade*, and every encouragement given to *commercial industry*, Agriculture has been totally neglected; though, at the same time, it is hardly necessary to observe, that manufactures and commerce, are neither so permanent a source of national prosperity, as the proper cultivation of the soil; nor do they furnish occupation to a description of persons, so remarkable for the integrity of their private conduct, so little inclined to disturb the peace and good order of society, or so able to defend their country, by their personal vigour and strength, as the farmer and the husbandman.

It may be said, that public attention and encouragement can be of no service to agriculture. But, in the first place, it is to be hoped, that any idea of that kind will not be given way to, until the experiment is fairly tried: in the second place, no ground should be given to the farmer, to imagine, that his interests are neglected, or his profession despised: and in the third place, there is every reason to believe, that public countenance at least, instead of being useless, cannot fail to be attended with the happiest consequences in promoting Agricultural Improvement.

There are three points on which the prosperity of Agriculture must depend. 1. Upon giving the farmer an opportunity of acquiring, with as little trouble and expence as possible, full information respecting the best and most advantageous methods of managing his farm. 2. Upon exciting a spirit of industry and experiment among that description of

men. 3. Upon the farmer having a sufficient capital or credit to carry on his operations. With the last it is impossible that the public can have any connexion*: but in regard to the two first points, it is evident that Government may, at a small expence, give the farmer all the information that is necessary; and, either by honorary rewards, or even by giving every active and intelligent cultivator an opportunity of corresponding with a respectable public Board, on subjects connected with his pursuits, may make Agriculture so much a topic of conversation among that class of men, may turn their attention so much to the improvement of the soil, and may excite such an ardour for that purpose, that the happiest consequences may be expected, both to the individuals engaged in that particular profession, and to the kingdom at large.

It is on these principles, that Sir John Sinclair takes the liberty of suggesting the following Plan of a Board of Agriculture. His original idea was, to restrict it to the amelioration of British wool alone; but he is now satisfied, that with much the same trouble, and at nearly the same expence, the same Board may successfully direct its attention, to every point connected, with the internal improvement of the country.

* By the farmer, in the above paragraph, is meant *the mere husbandman*, who has only occasion for small sums, and whose security cannot always be depended on. In regard to lending money to the landed interest, in large sums, for which their property might be made responsible, the case is different. In the History of the Public Revenue, part II. p. 126. originally printed in 1785, I have hinted at the wonderful advantages which might be derived, by expending the surplus of the public revenue, in promoting agricultural improvement. Probably a better use for a sinking fund than any other mode of application. By lending the produce of the sinking fund, on landed security, for the improvement of the country, the public would not only accumulate as great an additional annual income, as by purchasing 3 per cent. stock, but would also acquire a great revenue, from the rapid increase of national prosperity, by which the produce of the taxes, on consumption at least, would be greatly augmented.

PLAN OF THE BOARD.

It is proposed that the Board shall consist of twenty-four members, in the same manner as the present Board of Trade*, but not to be restricted to members of his Majesty's Privy Council, as the President of the Royal Society, and other persons, who are not in either House of Parliament, may be useful members. The advantages of a great number of members are, first, that it totally precludes every possible idea of giving salaries to the Board, which would not answer any real purpose of utility, and would at the same time make the institution expensive. Secondly, it would give occupation of a public nature to many respectable individuals, both in and out of Parliament, who are anxious to be employed in public business, but who at present have no particular object, to which they can direct their attention.

The expence of such a Board may be estimated at about 3,000*l.* per annum, to be laid out in the following manner ;

	<i>per annum.</i>
1. Expence of the house, a secretary and two clerks (for the correspondence will be very extensive), may be stated at - - -	£. 500 0 0
2. Stationary may amount to - - -	200 0 0
3. Foreign correspondence respecting the Agriculture of other countries, procuring foreign books on Agriculture, seeds, animals, and implements of husbandry - - -	300 0 0
4. The expence of sending persons to make regular annual surveys of the state of agriculture and sheep-farming, all over the kingdom, for the purpose of establishing corre-	

Carry over £1000 0 0

* With, however, an unlimited number of *honorary and corresponding members.*

	<i>per annum.</i>
Brought over -	£1000 0 0
Expence, of ascertaining what improvements have been made, in different parts of the country, the principal defects of each district in the management of their farms, &c.	500 0 0
5. The expence of printing and circulating those surveys, and other works that may be published under the sanction of the Board, together with honorary rewards to corresponding members, who try, in different parts of the country, such experiments, for the improvement of wool, &c. as may be recommended by the Board - - -	500 0 0
6. The expence of collecting the materials of a Statistical Survey of England, to be carried on under the sanction of the Board of Agriculture - - - - -	500 0 0
7. Incidental expences - - - - -	500 0 0
	£3000 0 0

The above sum, it is believed, will be found adequate to the purposes in view; and in order to obviate every possible objection on the score of expence, it is proposed to establish such a Board for five years only, merely by way of experiment; to be afterwards continued, in the event alone of its answering the important objects for which it was constituted. It was at first intended to propose some additional expence to be laid out in premiums; but upon farther consideration, it was judged more adviseable to leave the giving of *money* in premiums to private societies, and to restrict the donations of a public Board, to honorary rewards.

That the public ought not to grudge such a sum for so necessary a purpose, need hardly be long dwelt upon. For objects of general utility, Parliament has often, and ought always to exert itself. The Board of Trade is necessarily attended with some expence. The Royal Society had, from
its

its commencement, & grant of land from the crown. The Board of Longitude has had various considerable sums laid out as premiums, under its authority, for rewarding such as have made any important discovery in the point to which its attention is directed. The culture of flax has been encouraged by public bounties. And where is the object so well entitled to national countenance and support, as that of promoting the general interests of Agriculture, and of ascertaining the best means of bringing it to perfection?

The advantages of such a Board are obvious.

I. It is well known that there are many societies for the improvement of agriculture, in all its various branches, already scattered over the kingdom; and many more would probably be established, were Parliament to sanction the objects of such societies by its approbation. The establishment of such a Board, there is reason to believe, would be of incredible service in keeping up the spirit of such institutions, in giving them a proper direction, and in procuring for them more weight and consequence in those parts of the country where they exist. Besides, at present, any improvements made by such societies, are only known within their own narrow sphere; whereas they might be rapidly spread over the whole kingdom, through the medium of a Board of Agriculture, with whom every one of them would be desirous of corresponding.

II. In regard to the idea, that the whole had better be carried on by a private society, it is to be observed, that *no private society* can ever have the same weight, either with the farmer at home, or with foreign countries (from which undoubtedly much information may be obtained), as *a public institution*. In the second place, no private society could be intrusted, like a public Board, with a power of receiving and transmitting letters, and even packets, duty free, without which, at the same time, it could not be of general benefit; for it is only by frequently dispersing small tracts, and not voluminous publications, that the farmer can best be instructed, and roused to activity and exertion. In the third place, a public Board may easily collect into one focus, all the knowledge and in-

formation that may be acquired by a great number of small societies scattered over the kingdom; may make them useful to each other, and mutually co-operate for the general benefit of the country; but that is a degree of authority, which no private society, however constituted, could possibly acquire.

III. It is now found that an union of husbandry and sheep-farming is the best means of bringing agriculture to perfection; whilst, at the same time, it furnishes the raw material for our most valuable manufacture. By carrying the improvement of our wool, both in regard to quantity and quality, as far as the soil and climate of Great Britain will admit of (which, if such a Board were established, might be done in the space of a few years), there is every reason to believe, that three millions *per annum*, in manufactured articles, will be added to the national wealth, in addition to the benefit which the soil will receive from an improved system of husbandry*.

IV. But the part of the plan from which the greatest and most important benefits are to be expected, is that of carrying on a Statistical Survey of England, for the purpose of ascertaining, the real political situation of that part of the kingdom, in every point of view, respecting which a statesman would wish to have information. In the short period of about three years, such a Survey of Scotland will be completed, by the voluntary exertions of the clergy of North

* There are, at the smallest computation, twenty millions of sheep in Great Britain, whose fleeces may be increased in value to the amount of a shilling each, either by augmenting the quantity or improving the quality of their wool. The increased value of the wool, therefore, would amount to one million, which would be trebled by the art of the manufacturer, and consequently would produce three millions. To this there is to be added, the benefits that would result from the introduction of sheep-farming into different parts of the country, which are better calculated for sheep than for cattle; the superior advantages of which would soon decisively appear, from the inquiries carried on by the Board now proposed to be established.

Britain; and in the space of five years, a similar survey of England, may be brought to a conclusion. The object of such a survey would be, to ascertain the general state of the Agriculture, the Manufactures, and the Commerce of the country—the means of improvement of which they are respectively capable; the amount of the population of the state, and the causes of its increase or decrease: the manner in which the territory of the country is possessed and cultivated; the nature and amount of the various productions of the soil; the value of the personal wealth or stock of the inhabitants, and how it can be augmented; the diseases to which the people are subject, their causes, and their cure; the occupations of the people—where they are entitled to encouragement, and where they ought to be suppressed; the condition of the poor—the best mode of maintaining them, and of giving them employment; the state of schools, and other institutions formed for purposes of public utility; the state of the villages, and of the towns in the kingdom, and the regulations best calculated for their police and good government; and lastly, the state of the manners, and morals, and the general character of the people, and the articles in regard to which their situation is most capable of melioration and improvement.

To conclude, it is only by means of such inquiries, that any society can possibly expect to enjoy all that political happiness to which it must naturally aspire. By ascertaining facts with minuteness and accuracy, the real state of the country must be made known, and the means of its future improvement will be pointed out. Every field, it may be expected, will then be cultivated to the best advantage, and every measure will be taken, that can best tend to promote the general interests of the community.

APPENDIX. B.

Substance of Sir John Sinclair's Speech in Parliament, on the 15th of May 1793, when he proposed the Establishment of a Board of Agriculture.

SIR JOHN SINCLAIR began with stating, that having been much occupied of late, in the duties of a new and laborious employment, connected with the preservation of the commercial credit of the country (*that of commissioner for the issue of certain Exchequer bills*), he had unfortunately been induced to delay, from time to time, arranging his thoughts, and the information he had collected, on a subject of so very different a nature, as that of husbandry; and consequently was not prepared to state his sentiments upon the question, to which he now begged to call the attention of the House, so fully as he could have wished: such a circumstance, however, was of less importance, as it was surely unnecessary in that House, to descant upon the various public advantages to be derived from agricultural industry, or to attempt to prove, that it was the surest and best basis of national prosperity. These were principles which few thinking and intelligent men were disposed to resist. But an opinion had very much prevailed, that the interference of Government, in matters of that nature, had an injurious tendency; that it was the wisest plan to leave them entirely to themselves; and that any public aid or countenance was totally unnecessary.

No position, however, could be more erroneous. If the public were to *dictate* to the farmer how he was to cultivate his grounds, or how he was to improve his stock, the enforcing of such directions might be the source of infinite mischief; but to collect information on the subject of agriculture; to print and circulate that information, when collected; to encourage

courage a spirit of experiment; and to favour with public countenance, and perhaps with public aid, such as shewed a good example of rural industry to their neighbours, instead of being mischievous, must be attended with the happiest consequences; and though, in some parts of the kingdom, the principles of agriculture unquestionably were well understood, and the ground was kept in a very high state of cultivation, yet when it was considered—that immense districts, situated in the richest parts of England, and naturally fertile, still continued waste and useless—that a very small proportion of the cultivated part of the kingdom had as yet been brought under a proper system of husbandry—that any degree of perfection in the implements of husbandry had been rarely attained—and that the stock of the farmer had been still more rarely brought to that height of improvement, of which it was capable, it was surely a matter of surprise, whence it arose, that a measure of so important a nature as the present, embracing such a variety of interesting objects, had not been sooner brought under the consideration of parliament. “We had heard much, he observed, of other sources of national prosperity, but we seem to forget that no nation could be permanently happy and powerful, that did not unite a judicious system of agriculture, to the advantages of domestic manufacturing industry, and to the benefits of foreign commerce.”

The great advantages to be derived from agricultural improvements, might, he said, be stated in various points of view.

It is supposed that there are sixty-seven millions of acres in Great Britain, of which seven millions are occupied with houses, roads, rivers, lakes, &c. or by nature are totally incapable of cultivation; there remained therefore sixty millions; five millions of which only were employed in raising grain, twenty-five millions were appropriated to pasturage, and might be considered as sufficiently productive, and there remained thirty millions, either completely waste, or under a very defective system of husbandry. That was an object, in every point of view, of astonishing value and importance.

Disgrace-

Disgraceful indeed it was, that nearly one half of the kingdom, which, by fair calculation, might furnish subsistence to above ten millions of people, should remain in such a state.

The stock of the farmer, he observed, might be rendered infinitely more valuable than at present, without requiring a greater quantity of food, or any additional care or expence.

Of black cattle it is supposed that there are five millions in the island. As the breed of cattle has not been brought to any great perfection, except in particular districts, an addition of a pound sterling to the value of each, would not probably be found too high an estimate, though this would add five millions *per annum* to the national wealth.

There are at least twenty millions of sheep in these kingdoms, which might be greatly improved in regard both to fleece and carcass. On the supposition, however, (in some cases, by increasing the quantity; in others, by improving the quality of the fleece, leaving the carcass, for the present, out of the question), that one shilling was added to the value of the wool of each sheep, the result would be one million sterling. The manufacturer of wool, it is well known, can treble the value of the raw material, and consequently there would thence arise an addition of three millions *per annum* to the wealth of the nation. The profit that would arise by improving the carcass, in the opinion of the ablest breeders, would be still more considerable.

Great improvements might also be made in other kinds of stock. Great savings would arise by the use of improved implements of husbandry, whilst by following judicious systems, adapted to the different soils in the kingdom, ground would be cultivated at much less expence, and with a greater prospect of advantage. In addition to all which, it is to be considered, that these improvements would furnish the means of useful and healthful occupation to many thousands, almost millions of people, who, from the integrity of their private conduct, and the strength and vigour of their constitutions, are undoubtedly that description of persons, whom it

is natural to wish should, as much as possible, be multiplied in these kingdoms.

For the purpose of securing all these advantages, and in order to direct the attention of the people of this country to improvements of a nature so beneficial and so permanent, he was perfectly satisfied that the establishment of a national Board of Agriculture, was absolutely necessary.

The advantages of such a Board were obvious.

In the first place, it might be considered as a general magazine for agricultural knowledge, and a board of reference, to which any question might be sent, connected with the improvement of the country. At present, Government had no channel for obtaining information, respecting many points, in which the general interests of the country were deeply involved. Questions respecting commerce were referred to a Board of Trade, constituted for that express purpose; but no channel as yet existed for obtaining authentic information respecting the agriculture of the country, though undoubtedly of more general importance.

In the second place, by agricultural surveys, carried on under the auspices of such a Board, every fact or observation known in this country, connected with the improvement of the soil, or the stock it maintained, would soon be collected. The circulating of that information could not fail to be attended with the happiest consequences. The discoveries of one district would be immediately communicated to another; a spirit of experiment would be excited; and every farmer in the kingdom would contribute his mite to the general benefit of his profession.

In the third place, by establishing an extensive foreign correspondence, no improvement or discovery could be made in husbandry, in any quarter of the globe, that would not be immediately made known, and communicated to the people of this country, with much greater speed, and to greater advantage, than if private exertion and correspondence were alone to be depended on.

In the fourth place, a public Board might be entrusted with the privilege of franking, a point of very great importance, for

without that privilege, it is well known that no information, however useful, except at an enormous expence, could be rapidly spread over the country. That was a privilege with which no private society could be invested, but to which a public body had the justest pretensions.

In the fifth place, it was only through the medium of such a Board, that any general improvement of stock could be looked for. Such improvement, however desirable, could not always be effected without concentrating the knowledge of a great number of individuals of different professions: In regard to sheep, for instance, the breeder, the grazier, the manufacturer of wool, the butcher, the currier, and the consumer, must all be satisfied, that a change in the breed of any particular district is calculated for their respective interests. So great an alteration in the opinions and the prejudices of great numbers of individuals, could only be effected by the authority and influence of a public Board, and far surpassed the exertions of any body of private men, however active or respectable.

In the last place, such a Board might be the means of obtaining a Statistical Account of England; and consequently of explaining the real situation of the country, in every point of view that could possibly be wished for by a patriot or a statesman. Such an account of Scotland was already nearly completed, and specimens of it having been circulated abroad, it had received the most flattering marks of approbation. If in England, therefore, the same plan were executed, it would hardly be doubted that it would soon be universally adopted in every other country; and thus the principles of political society, and the sources of national improvement, would be more completely ascertained than in any former period of history.

That such was the natural tendency in the mind of man, to startle at any new proposal, that he certainly would not have ventured to have made such a motion in Parliament, had he not every reason to believe, *from much experience in undertakings of a similar nature*, that it could not fail to be successful; and, in order to satisfy the most timid and scrupulous, he intended to propose, that the expence should not exceed 3000*l. per annum*,

annum, and that the experiment should only be tried for the short period of five years; at the conclusion of which, however, he trusted that the advantages of the institution would be so clear and manifest, that he would be a bold and hardy man indeed who would oppose its being continued. It was also intended, that the members of the Board should act without any emolument whatever. He added, "that such as had witnessed the laborious exertions of those gentlemen, who were nominated to the important trust of preserving the commercial credit of the country, would not hesitate to declare, that the business of a Board, who have no salaries annexed to their situations, may be ably and faithfully administered."

That the mention of the Board above alluded to, would justify the observation, that if at any time attention to agriculture was necessary, the present undoubtedly was the moment; when the hazardous state of commercial enterprizes, was so clearly demonstrated, and when it has become necessary to think how to furnish the means of subsistence to a multitude of individuals, who, in consequence of the late failures of a mercantile and manufacturing nature, have been driven from their usual sources of employment.

That when persons talked with raptures of the great wealth brought into this country by commerce, they did not consider that the nation, in many cases, lost as much by neglecting agriculture as they gained by commerce; of which a stronger instance could not be given than this—that in the northern parts of England, in the course of last harvest (1792) grain to a very considerable amount actually perished for the want of labourers to gather in the crop, all the hands in the neighbourhood being employed in carrying on manufactures. It was evidently of little consequence gaining in one respect, if in another a loss was sustained, of equal, or perhaps of superior importance.

That an ancient author, (Pliny) had happily described the natural sources of the wealth of this country, and his sentiments on that subject, in the nervous translation of that great political

political writer, Harrington, in his *Oceana*, could not be too frequently recalled to the attention of the people of Great Britain. "O! most blessed and fortunate of all countries, Britannia! How deservedly has nature, with the blessings of heaven and earth, endued thee! Thy ever fruitful womb, is not closed with ice, nor dissolved by the raging star. Thy woods are not the harbour of devouring beasts, nor thy continual verdure the ambush of serpents, but the food of innumerable herds and flocks, presenting thee, their shepherds, with distended dugs or golden fleeces." Such was the opinion of an intelligent author, who wrote so many centuries ago. "Let me ask," he said, "whether the distended dugs, and golden fleeces of the country, are not still among the principal characteristics of British wealth?"

That the objections to such a proposal (if any could be seriously urged) it was unnecessary to anticipate. It was one of those measures, it might be said, which, if it produced no good, could not possibly do any harm, but which he viewed in so different a light, that he had no hesitation in pledging any little credit he might have in the House, that it would be the source of as much real benefit to the country as any proposition that ever was brought under the consideration of Parliament.

On these grounds he took the liberty of moving, "That an humble Address be presented to his Majesty, intreating that his Majesty would be graciously pleased to take into his Royal consideration the advantages which might be derived by the public from the establishment of a Board of Agriculture and Internal Improvement, &c. &c."

APPENDIX. C.

Substance of Sir John Sinclair's Address to the Board of Agriculture, on the first Day of its being assembled.

THAT he could not forbear troubling the Board with a few words, congratulating the members present on the complete establishment of so invaluable an institution as that of a *Board of Agriculture*. That in other countries attempts of a similar nature, on a humbler scale, had been made; but that the present, he believed, was the first instance of such an institution having been snatched from the feeble hands of individuals, and invested with all the strength and vigour of public establishment.

That from the circumstance of his having moved in Parliament for the establishment of that Board, HIS MAJESTY had been graciously pleased to nominate him as President, a situation to which he could not otherwise have aspired among so many members, distinguished by superior talents, and possessed of greater experience and skill in husbandry; but that he would endeavour to make up for any personal deficiency, by the most unwearied zeal and attention to promote the objects for which the Board was constituted.

That no man would have ventured to have made such a motion in Parliament without having previously sketched out, in his own mind, some general ideas respecting the system that might be pursued, in case the proposed institution should take place, and that he would shortly state to the Board, what had occurred to him upon the subject.

That having carried on, for some years past, a correspondence with above 1500 individuals, on matters of a public nature (for promoting the improvement of British wool, and examining, with great minuteness, into the political state of

Scotland), he was enabled, by the experience which he had thus acquired, to ascertain, in a great measure, those leading principles, on which so great and extensive a plan might be conducted, and these he would shortly submit to the consideration of the meeting.

That, in the first place, he had much satisfaction in stating, as the foundation on which the edifice of national improvement might be built, that there existed in these kingdoms a greater fund of solid ability, and of useful information, and a greater extent of actual and efficient capital, than, so far as he could judge, any other country of the same extent and population in the universe could boast of; and that little more would be necessary, but to call forth that ability, and to collect that information, and to give the capital of the country a direction or tendency to increase internal wealth and cultivation, in preference to more distant objects, in order to make this island, what it ought to be, "*The Garden of Europe.*"

In the second place, he was certain that there existed a greater mass of public spirit in the nation at large, (more especially among that description of people with whom the Board of Agriculture was principally connected,) than was commonly imagined; and he was satisfied, that the Board would find no difficulty in prevailing on the active and intelligent husbandmen of this kingdom, to try any experiment, or follow any system, that could contribute to the public good, and did not materially militate against their own personal interest; and that a wide difference would be found between a recommendation to improvement, coming from a respectable public body, than if it came from private individuals.

In the third place, this principle ought ever to be kept in view, that in a good cause, nothing can resist industry and perseverance. That at first, some doubts or jealousies might be entertained of a new institution, and some rumours might be circulated respecting the objects of the Board, which time would soon do away. But for his part, he entertained no doubt, that if Parliament would continue its pecuniary assistance for some years, (promoting, at the same time, by wise regulations, a general system of improvement,) and if the Board
(which

(which he was persuaded would be the case) would steadily persist in its exertions, that in a very short period, the produce of many millions of acres, now cultivated in a very defective manner; would be greatly augmented; that many millions of acres, now lying waste, would be brought under cultivation, and that the stock of the kingdom would be improved to at least double its present value.

In regard to the plan to be pursued, he submitted to the consideration of the Board, whether the first object ought not to be, *to ascertain facts*, without which no theory or system of reasoning, however plausible, could be depended on. That for that purpose, it would be necessary to examine into the Agricultural State of all the different counties in the kingdom, and to inquire into the means which, in the opinion of intelligent men, were the most likely to promote either a general system of improvement, or the advantage of particular districts. That by employing a number of able men for that purpose, and circulating their Reports previous to their being published, requesting the additional remarks and observations of those to whom such communications were sent, it was probable, that no important fact, or even useful idea, would escape notice.

That the immense mass of information thus accumulated, would answer two purposes: first, it would point out the measures which the Legislature might take for promoting Agricultural improvements; secondly, individuals would thus be instructed by the practice and experience of others—the landlord in the proper mode of managing his property, and the farmer in the best plan of cultivating his fields.

That for attaining the first object, that of legislative assistance, it would be proper to digest the substance of the information that was accumulated into one Report, to be submitted to the consideration of HIS MAJESTY, and of both Houses of Parliament; suggesting, in the Report, what measures had occurred, in the course of their inquiries, that could tend to the improvement of the country. He added, that from the spirit with which these Agricultural Surveys had been gone into, there was some reason to hope that a Report might be

drawn up, on the general state of the husbandry of the kingdom, in time sufficient to enable Parliament to take some effectual measures for the benefit of agriculture, in the course even of the ensuing session.

That Parliament might be of essential service to husbandry in two respects : first, by removing *all discouragements to rural industry* ; and secondly, by granting *encouragements*. That the second was a matter of much delicacy, and which required very mature consideration. At the same time it was certain, that by granting encouragements to Agriculture, the great Frederick of Prussia was enabled to double the value of his dominions, and to amass a very considerable treasure, amounting, it is well known, to many millions sterling. That such encouragements operated like manure spread upon the ground, which insured a more abundant harvest. That they also had a tendency to impress on the public mind this truth, “ that the proper cultivation of the soil, is an object so particularly interesting to the community at large, that those who most assiduously attend to it, are, perhaps, to be accounted the most meritorious citizens of their country.” That in one point of view, at least, the husbandman was more entitled to public attention than those who followed other professions, being more fixed to the territory on which he lived, and less apt, from habit, inclination, or ability, to wander from it.

That in regard to instructing individuals, no doubt could be entertained, from the great mass of information which would be accumulated, by the correspondence of the Board, both at home and abroad, that the best mode of managing landed property, or in other words, the most advantageous system of connection between the landlord and the tenant, would be ascertained, and that the principles of rational husbandry, for the instruction of the practical farmer, would soon be brought to a very great degree of simplicity and perfection.

That he would not anticipate, with too much confidence, the important consequences that might result from such an institution. He believed, however, there was none from which the public, at large had reason to expect so many substantial

stantial benefits. That the Board, indeed, was already looked up to, even by foreign nations, as likely to become *the general magazine of knowledge on agricultural subjects*. That they already considered it as the source from which they were to derive the most important information, and the most solid advantages. That in these respects, at least, agriculture had an advantage over other arts, that no jealousy subsisted among those who were engaged in it, and that every discovery which tended to its improvement, more essentially contributed, than any other, to promote the general good of the species.

He should only add, that if the measures he had ventured to hint at, and others connected with the internal improvement of the country, which he would afterwards take an opportunity of suggesting, were approved of by the Board, and carried on with alacrity and zeal, that he was willing to dedicate the whole of his time and exertions to assist in the prosecution of them; fully convinced that no pursuits could be more gratifying to the mind for the present, or would be recollected in future with more heartfelt satisfaction.

APPENDIX. D.

Sir John Sinclair's Address to the Clergy of the Church of England, on the Nature and Principles of Statistical Philosophy.

THE object of all political society evidently is this, that every individual connected with it, shall have the means of enjoying as much real happiness as the imperfect condition of human nature will admit of.

In order to secure an adequate proportion of happiness to each individual, it is a duty incumbent on every Government, whatever its form may be, to make minute and regular inquiries into the circumstances of the people over whom it is placed, for the purpose of ascertaining to what extent they already enjoy the advantages of political society, or in what respects their situation can be ameliorated*.

* If all Governments were impressed with a proper sense of this important duty, it would be of less consequence what the particular form was; only that form would be the most desirable, where such inquiries were the most likely to take place, namely, in a well-regulated monarchy, in which the people had a proper organ by which they could act; for under that form, as soon as the existence of the duty above alluded to was known and acknowledged, the prince, for the sake of the glory and the satisfaction resulting from statistical investigations; and the people, from feeling the advantages to be derived from them, would take care that any necessary inquiry into the state of the country should not be neglected. It does not require the spirit of prophecy to foresee, that as soon as the present war is over, such inquiries will become general in Europe. The attention of the people will then be diverted from delusive phantoms of ideal liberty, to those objects which constitute the real happiness of the individual, and the solid interest of the state.

To that science, which points out the proper objects of such inquiries, and the surest means of making them effectual; the science, consequently, which tends most to promote both the good of the individual, and the prosperity of a state; which indeed includes in it every object of real utility, connected with, or arising from, the existence of political society, I have ventured to give the name of STATISTICAL PHILOSOPHY*.

It

* It is now about forty years, as we are informed by professor Zimmerman, in his Political Survey of Europe, that a branch of political knowledge, which has for its object the actual and relative power of the several modern states, the power arising from the natural advantages, the industry and civilization of their inhabitants, and the wisdom of their governments, has been formed, chiefly by German writers, into a separate science. It used formerly to be improperly connected with geography; and it was but superficially treated amidst the topographical and descriptive details of the larger geographical works. By the more convenient form it has received, and by its growing importance, this science, distinguished by the new coined name of STATISTICS, is become a favourite study in Germany. The best account of the origin of statistical inquiries is given in Baron Bielfield's Elements of Universal Erudition.

In regard to the words *statistic* or *statistical*, they may either imply inquiries connected with the state of a country, or respecting matters of state; the first is the point of view in which I propose to consider them. The particular term made use of, however, is of little consequence. As to the thing itself, it may be sufficient to remark, that the inquiries instituted in Germany, of a *statistical* nature, were merely for the purpose of ascertaining the political strength of a country, and not the quantum of happiness it enjoys, and far less the means of its future improvement. This is a *new* branch of politics, therefore, the superior utility of which many of the most respectable characters in Germany, and in other parts of Europe, have acknowledged in the most flattering terms, and which a great American warrior and statesman, the President of the American Congress, (General Washington) in a letter to the author, has thus characterized. "I cannot but express myself highly pleased with the undertaking in which you are engaged (that of drawing up the *Statistical* Account of Scotland), and give my best wishes for its success. I am fully persuaded, that when enlightened men will take the trouble to examine so minutely into the state of society, as your

It is not proposed, on the present occasion, to enter minutely into the various important topics connected with so extensive a subject. It may be sufficient now to remark, that it is by an anxious attention to facts, to which the great improvements which have been recently made in chemistry, in mechanics, and in other arts and sciences, can alone be attributed. Since these have rested, not on visionary theory, but on the sure basis of investigation and experiment, they have been carried, in modern times, to a degree of certainty and perfection, of which anciently they were supposed incapable. It is by pursuing the same method, in regard to political disquisitions, by analyzing the real state of mankind, and examining, with anatomical accuracy and minuteness, *the internal structure of society*, that the science of government can alone be brought to the same height of perfection.

Many inquiries, it is certain, have at various periods been made into the political circumstances of nations: unfortunately, however, they have uniformly been instituted with a view of ascertaining the state of the country, for the purposes of taxation and of war, and not of national improvement. Their object has been, not to meliorate the condition of the people, but to fill the exchequer, or the armies of the state*; and the

“inquiries seem to go, it must result in greatly ameliorating the condition of the people—promoting the interests of civil society—and the happiness of mankind at large.—These are objects truly worthy the attention of a great mind, and every friend to the human race, must readily lend his aid towards their accomplishment.”

* Sallust, in his *Orat. ad Cæsarem de Republ. ordin. II. i. cap. i.* has clearly explained the objects of ancient statesmen. “In republica, cognoscenda, multam, magnamque, curam habui, uti quantum, *armis, viris, opulentia*, ea possit, cognitum haberem.” From Townsend’s *Travels to Spain*, vol. iii. p. 348, it appears, that in 1575, Philip II. proposed making similar researches, on a very great and extensive scale; but they never seem to have been brought to any conclusion. In France, in Prussia, in Sweden, in Saxony, in Sardinia, and in Tuscany, such plans have been attempted; but with a view of ascertaining the present state, rather than the means of future improvement.

utmost that could be expected from them, was to render taxation, and other public burdens, less unequal. But, in modern times, more extensive and more important objects of investigation have been pointed out. Real statesmen, and true patriots, no longer satisfied with partial and defective views of the situation of a country, are now anxious to ascertain the real state of its agriculture, its manufactures, and its commerce;—the means of improvement of which they are respectively capable—the amount of the population of a state, and the causes of its increase or decrease—the manner in which the territory of a country is possessed and cultivated—the nature and amount of the various productions of the soil—the value of the personal wealth or stock of the inhabitants, and how it can be augmented—the diseases to which the people are subject, their causes and their cure—the occupations of the people—where they are entitled to encouragement, and where they ought to be suppressed—the condition of the poor, the best mode of maintaining them, and of giving them employment—the state of schools and other institutions formed for purposes of public utility—the state of villages and towns, and the regulations best calculated for their police and good government—the state of the manners, the morals, and the religious principles of the people, and the means by which their temporal and eternal interests can best be promoted.

Impressed with the deepest sense of the nature and importance of the objects abovementioned, in the month of May, 1790, I circulated among the clergy of the church of Scotland a number of queries, for the purpose of elucidating the statistical situation of my native country. Nothing could be more flattering than the reception they met with from that learned and respectable body. Scotland is divided into about 950 parochial districts; and, in less than eighteen months, reports were received from above one-half of that number. The returns that were transmitted, also, were not trifling or superficial; but, in general, such as might be expected from men of extensive knowledge, and of sound abilities, acquainted with the various topics to which their attention was directed.

With so much zeal, indeed, have they entered into this inquiry, that, in less than four years from its commencement, this great and extensive Survey will be nearly completed.

Astonished with so rapid a progress, and convinced that the most important and beneficial consequences must be derived from it to mankind in general, but more especially to these kingdoms of Great Britain and Ireland, I flatter myself, that no doubt can now be entertained in the mind of any one, respecting the propriety of carrying on a similar inquiry in the southern part of the island. The possibility of completing such an investigation has formerly been questioned, but every idea of its being impracticable is now done away, by its success in Scotland. The clergy of the church of England, who have so long distinguished themselves by their splendid exertions in every branch of literature, will not surely suffer so favourable an opportunity to escape, of adding to their character and their fame. It is an undertaking which, however great and laborious, they undoubtedly have the power, and I have no doubt, it will be found, they have also the inclination, to accomplish. To have their attention directed to so many important and useful objects of inquiry, will prove a greater source of pleasure and improvement than it is possible at first to conceive; and being engaged in a great pursuit, which unites the *utile* and *dulce*, will soon appear the most pleasing of all occupations. There is now also a public institution (the Board of Agriculture and Internal Improvement) constituted, among other objects, for the express purpose of facilitating the progress of such a measure, and of bringing it as speedily as possible to a conclusion. Nor ought it to be omitted, that the Church of England was never more happily distinguished, by learned and respectable characters, whose enlarged and liberal views, will naturally lead them to encourage such investigations.—In order to explain their general nature and tendency, and the best means of carrying them into execution, it is proposed to circulate the annexed analysis of the statistical account of a parochial district, or of any other territorial division, tables which may render such accounts less obscure or voluminous, and SPECIMENS OF THE ACCOUNTS OF CERTAIN DIS-

TRICTS IN SCOTLAND, in many respects differing from each other, and including almost every possible variety*.

It is only necessary to add, that if this Survey is happily completed, and similar ones are afterwards periodically taken every fifty or one hundred years, they will furnish the best means of ascertaining the progress of national improvement, and will point out the proper system to be pursued, in order to bring political society, in these kingdoms, to the highest pitch of happiness and perfection.

* The specimens above alluded to, will be found in the Statistical Account of Scotland, and consisted of the following articles :

No. I. Specimen of a pastoral district—United parishes of Kinnisnochie and Inch, county of Inverness.

No. II. Specimen of a small inland agricultural district—Parish of Morham, county of East Lothian.

No. III. Specimen of a greater agricultural district, situated on the coast—Parish of Graitney, or Gretna, county of Dumfries.

No. IV. Specimen of a district where manufactures have commenced—Parish of Moulin, county of Perth.

No. V. Specimen of a district where manufactures have been established, with a view of the effects they have on the manners, the morals, and the health of the inhabitants—Parish of Nielston, county of Renfrew.

No. VI. Specimen of a town and district, with manufactures and foreign commerce—Town and parish of Montrose, county of Angus.

No. VII. Specimen of the statistical account of a large city, giving a view of the progress of arts, luxury, and refinement—City of Edinburgh, &c.

*Analysis of the Statistical Account of a Parochial District,
or of any other territorial Division in a Country.*

Name of the district, and its origin.	Number of seamen.
Its situation and extent.	State of the church.
Number of acres.	Patron, glebe, parsonage, &c.
Description of the soil and surface.	Number of poor.
Nature and extent of the sea coast.	Parochial funds, expence of the poor, and mode of management.
Lakes, rivers, islands, hills, rocks, caves, woods, orchards, &c.	State of the schools, and number of scholars.
Climate and diseases.	Ancient state of population.
Instances of longevity.	Causes of its increase or decrease.
State of property.	Annual average of births, deaths, and marriages.
Number of proprietors.	Number of families.
Number of residing proprietors.	Exact amount of the number of souls now living.
Mode of cultivation.	Number of males.
Implements of husbandry.	Number of females.
Manures commonly made use of.	Division of the inhabitants, by the place of their birth; by their residence, whether in town, in villages, or in the country; by their ages, occupations, &c.
Seed time and harvest.	Number of houses.
Remarkable instances of good and bad seasons.	———— uninhabited houses.
Price of grain and provisions.	Minerals in general.
Total quantity of grain and other articles consumed in the parish.	Mineral springs.
Wages and price of labour.—	Coal and fuel.
Hours when labour commences and ceases at the different seasons.	Eminent men.
Personal services, whether exacted or abolished.	Antiquities.
Commerce.	Parochial records.
Manufactures.	Miscellaneous observations.
Fisheries.	Character of the inhabitants.
Towns and villages.	Their manners, customs, stature, &c.
Police.	Advantages and disadvantages of the district.
Inns and alehouses.	Means by which the situation of the inhabitants can be meliorated.
Roads and bridges, private, parochial, or public.	
Harbours.	
Ferries, and their state.	
Number of ships and vessels.	

It might be the means of shortening such Accounts considerably, if the information respecting a number of articles were condensed as much as possible, in the shape of a Table, according to the annexed Specimen.

STATISTICAL TABLE OF THE PARISH OF —

Length in English miles	_____	married persons	-
Breadth	_____	children, at an average,	
Population 40 or 50 years ago	_____	from each marriage	
_____ <i>anno</i> 17	-	twins, &c. born in the	
Increase (or decrease)		parish for the last 10	
Average of births	} for any number of years pre- ceding 17	years	- -
_____ of deaths		_____ bachelors, or unmar-	
_____ of marri- ages		ried men above 50	
Inhabitants in towns	-	_____ unmarried women a-	
_____ in villages	-	bove 45	-
_____ in the country	-	_____ widowers	-
Number of males	-	_____ widows	-
_____ females	-	_____ males born out of the	
_____ persons under ten years		parish	- -
of age	-	_____ females ditto	-
_____ between 10 and		_____ persons born abroad	
20	-	_____ in Eng-	
_____ between 20 and		land	
50	-	_____ in Ireland	
_____ between 50 and		_____ in the Co-	
70	-	lonias	
_____ between 70 and		_____ proprietors residing	
80	-	non-residing	-
_____ between 80 and		_____ clergymen	-
90	-	_____ merchants	-
_____ between 90 and		_____ physicians	-
100	-	_____ surgeons.	-
_____ above 100		_____ midwives	-
_____ families	-	_____ writers, or attornies	
_____ houses inhabited		_____ schoolmasters	
_____ ditto uninhabited		_____ farmers under 50 <i>l.</i> <i>per</i>	
_____ new houses built with-		<i>annum</i>	-
in these 10 years		_____ ditto from 50 <i>l.</i> to 100 <i>l.</i>	
_____ old ditto pulled down		_____ ditto from 100 <i>l.</i> to	
		300 <i>l.</i>	-

Number

Number of farmers from 300/.	annual income -
to 500/.	young persons taught
ditto above 500/.	writing, arithmetic,
shopkeepers -	&c. - -
Innkeepers, greater	Latin - -
and smaller -	Greek - -
smiths - -	at the university
masons - -	ships - -
carpenters -	small vessels -
weavers - -	boats - -
shoemakers -	seamen - -
tailors - -	fishermen -
butchers -	persons serving in the
millers - -	navy during the last
bakers - -	war
gardeners -	ditto in the army
male domestic servants	Average of persons who have
female ditto -	settled in the district
male farm servants	during the last 5 or
female ditto -	10 years
(Add any other occu-	ditto who have emi-
pation by which a	grated from it
person gains a liveli-	Number of acres, statute mea-
hood in the district.)	sure -
poor - -	wheel carriages
property belonging to	carts - -
them -	ploughs -

In some places the following TABLES also might perhaps be filled up, but in no case ought this to be attempted, unless it is perfectly agreeable to the inhabitants of the District.

Rent, anno 17	£. s. d.	Value of articles exported*	£. s. d.
— anno 17	—	— ditto imported	—
Rents spent in the district		Balance	—

VALUE OF STOCK.

	valued at	each.	Total
	£. s. d.		£. s. d.
Number of draught horses			
— saddle and carriage horses			
— best cattle			
— inferior ditto			
— best sheep			
— inferior ditto			
— goats, swine, &c.			
Value of carts, ploughs, and other imple- ments of husbandry			
Total value of stock			£.

* It would be desirable also to ascertain the nature and amount of the articles exported and imported, as well as their value, as is done in the parish of Graitney. See Statistical Account of Scotland.

ANNUAL PRODUCE.

Crops.	Number of Acres under each.	Produce per acre Bushels	Price per bushel £. s. d.	Total price per acre. £. s. d.	Total produce. Bushels.	Total value. £. s. d.
Wheat						
Barley						
Oats						
Beans						
Peas						
Potatoes						
Flax						
Turnips						
Cabbage, &c.		Stones	per stone		Stones	
Meadow hay, or natural grafs						
Sown grafs						
Straw, at		per quarter of corn				
Pasture, at		per horse ;	per cow ; and		per sheep	
		Annual produce of gardens				
		— orchards				
		— woods and plantations				
		— fisheries				
		— mines				
Total value of annual produce						

III. CACHECTICAL DISEASES.

	Under 6 Ms.						Betw. do & 1 Yr.						Above 100						Total.
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	
Atrophy																			
Tympany																			
General Dropsy																			
Dropsy of the Brain																			
— Breast																			
— Belly																			
Tumour of the Belly																			
Rickets																			
Serophula																			
Veneral Disease																			
Sturvy																			
Jaundice																			
Total																			

TABLE OF DEATHS, AGES, AND CONDITIONS.

Ages	Males	Females	Ages	Bachelors	Husbands	Widowers	Mills	Wives	Widows	Total	Born in the city	Born elsewhere	Inhabitants	Strangers
Under 1 month			20—30											
Between 1—2 months			30—40											
2—3			40—50											
3—6			50—60											
6—9			60—70											
9—12			70—80											
1—2 years old			80—90											
2—3			90—100											
3—4			100—110											
4—5			110—120											
5—10			1—30											
10—15			Total of ages and conditions											
15—20														
Total of the above ages														

Total of ages } Males
 under 20 yrs. } Fem.
 Tot. of ages and conditions

TABLE OF DEATHS, BIRTHS, AND MARRIAGES IN EACH MONTH.

	Deaths.		Births.		Marriages.				Total Deaths	Total Births	Total Marriages
	Males	Females	Males	Females	both unmar- ried before	Husb. mar- ried before	Wife mar- ried before	Both mar- ried before			
January - - -											1st Quarter.
February - - -											
March - - -											
April - - -											2d Quarter.
May - - -											
June - - -											3d Quarter.
July - - -											
August - - -											
September - -											4th Quarter.
October - - -											
November - -											
December - -											
Total for the Year											

It would be extremely desirable that the clergy in the country parishes, and some respectable physician, with the assistance of the magistrates, in towns, would regularly keep such Bills of Mortality and Tables, and would transmit them to the Board of Agriculture and Internal Improvement, at their Office in London: it might be the means of throwing much light on many important objects of political inquiry, in which the health and interests of the inhabitants of these kingdoms are deeply involved.

APPENDIX. E.

Plan of the Agricultural Surveys as originally proposed.

THE Board of Agriculture, will have occasion to employ some very intelligent surveyors, or persons skilled in husbandry, in examining into the agricultural state of all the different counties of England and Scotland, and in pointing out in what respects there is room for improvement.

The inquiries principally to be made, will relate to the following points :

1. The nature of the soil and climate of the district to be examined ?

2. The manner in which the land is possessed, whether by great or by small proprietors ?

3. The manner in which the land is occupied, whether by great or by small farmers ?

4. The manner in which the land is employed, whether in pasture, in husbandry, or a mixture of both ?

5. If in pasture, what grasses are cultivated ? what species of stock is kept ? whether the breeds can be improved, or whether new breeds ought to be tried ?

6. Whether any of the land is watered, and whether any considerable extent of ground is capable of that improvement ?

7. If the land is employed in husbandry, what are the grains principally cultivated ?

8. What is the rotation of crops ? and in particular, whether green crops, as turnips, clover, &c. are cultivated, and how they are found to answer ?

9. Whether fallowing is practised, or otherwise ?

10. What manures are made use of ?

11. What are the usual sorts of ploughs, carts, and other implements of husbandry ?

12. Whether oxen or horses are made use of ?
13. What is the usual feed time and harvest ?
14. Whether the land is inclosed or in open fields ?
15. What advantages have been found to result from inclosing land, in regard to the increase of rent,——quantity or quality of produce,——improvement of stock, &c.
16. What is the size and nature of the inclosures ?
17. Whether inclosures have increased or decreased population ?
18. Whether there are any common fields, and whether any division of them is proposed ?
19. What is the difference of rent, or produce, between common fields and inclosed lands ?
20. What is the extent of waste lands, and the improvement of which they are most capable, whether by being planted, converted into arable, or into pasture land ?
21. What is the rate of wages, and price of labour ; and what are the hours at which labour commences and ceases, at the different seasons ?
22. Whether proper attention is paid to the draining of land, particularly the fenny part of it, and what sort of drains are commonly made use of ?
23. Whether paring and burning is practised, and how it is managed and found to answer ?
24. Whether the country is well wooded, and whether the woodlands are kept under a proper system ?
25. What is the price of provisions, and whether the price is likely to be steady, to rise or to fall ?
26. What is the state of the roads both public and parochial, whether they are in good order, or capable of improvement ?
27. What is the state of farm houses and offices, whether in general they were well situated and properly constructed ?
28. What is the nature of the leases commonly granted, and the covenants usual between landlord and tenant ?
29. To what extent have commerce or manufactures been carried on in the district, and have they had either good or bad effects on its agriculture ?

30. Are there any practices in the district, that could be of service in other places?

31. Are there any societies instituted in the district for the improvement of Agriculture?

32. Whether the people seem to have a turn for improvements, or how such a spirit could best be excited?

33. What improvements can be suggested either in regard to the live stock or the husbandry of the district?

34. Are there any obstacles to improvements, and in what manner can they best be removed?

35. What are the names, descriptions, and address of those proprietors, or farmers, who are the most active, or the most skilful improvers in the district, and who are the most likely to be useful correspondents to the Board of Agriculture?

It is proposed, for the sake of making such Surveys as easy as possible, that each person, who may undertake them, shall have a district that may be gone over in five or six weeks: so that it may be undertaken by those, who have a good deal of business of their own, without much inconvenience. Thus also the Board will have a greater variety of information, and a greater mass of instructive observations, from a greater number of intelligent men, for their consideration and guidance.

It is farther proposed, that the reports received by the Board, shall first be circulated as much as possible, in the counties to which they relate, for the benefit of receiving the observations, and additional remarks of every farmer and gentleman in the district. From the information thus accumulated, a complete state of its Agriculture will be drawn up and published; copies of which will be presented by the Board, to every individual, who may have favoured them with his assistance.

The Board can only make an allowance, at the rate of 5*l.* per week, for the expence of such a tour. Indeed a number of persons, with great public zeal, and much to their credit, have undertaken to survey several districts gratuitously. But that is not always to be expected, particularly from professional

essional men. The payment of their expences, they are well entitled to expect, if they give their time and trouble for nothing. Profit, however, must not be the object of those who undertake such an employment; nor could such a Board wish to be concerned with any one, who would not willingly make some sacrifices for the public good, and indeed who would not take a pride in having any share in promoting so useful an undertaking.

P. S. If the district is remarkable for its orchards, for its cider, for its dairy, for its cheese, for its butter, for its breed of sheep, cattle, horses, hogs, &c. or the culture of woad, liquorice, &c. particular attention is requested to those articles, or to any other in which it may excel. Drawings also, and exact descriptions, of the different breeds of sheep, cattle, horses, and hogs, in each district, would be particularly desirable. The quantity raised of each sort of crop, in the different parts of the district, and the quantity of milk produced by the different breeds of cattle, or of wool by the different breeds of sheep, cannot be too accurately ascertained and noted.

APPENDIX. F.

Arrangement of the Agricultural Surveys, and the Persons by whom they were respectively undertaken.

ENGLAND.

	COUNTY,	PERSON.
	Norfolk - - -	Mr. Kent.
	Suffolk - - -	Mr. Arthur Young.
	Essex - - -	Messrs. Griggs of Hillhouse, and Mr. Charles Vancouver.
	Middlesex - - -	Mr. Foot.
5	Surry - - -	Messrs. Malcolm of Stockwell.
	Kent - - -	Mr. Boys of Bethanger.
	Suffex - - -	Rev. Mr. Young.
	Hants - - -	Messrs. Driver, and the Rev. Mr. Warner jun. for the Isle of Wight,
	Dorset - - -	Mr. Claridge.
10	Devon - - -	} Mr. Robert Frazer, and the Agriculture Societies of Devon and Cornwall.
	Cornwall - - -	
	Somerfet - - -	Mr. Billingsley.
	Wilts - - -	Mr. Davis of Longleat,
	Berks - - -	Mr. Pearce.
15	Bucks - - -	Messrs. Malcolm of Stockwell.
	Oxon - - -	Mr. Robert Davis.
	Bedford - - -	Mr. Stone.
	Leicester - - -	Mr. Monk, and the Agriculture Society of Leicester.
	Warwick - - -	Mr. John Wedge.
20	Northampton - - -	Mr. James Donaldson.
	Huntingdon - - -	Mr. Stone, and Mr. Maxwell,
	Herts - - -	Mr. David Walker.
	Rutland - - -	Mr. Crutchley of Burley.
	Chester - - -	Mr. Thomas Wedge.

	COUNTY.	PERSON.
25	Lincoln - - -	Mr. Stone.
	Cambridge - - -	Mr. Charles Vaucouver.
	Durham - - -	Mr. Grainger, and the Agriculture Society of Durham.
	Northumberland - - -	Mr. Bailey, and Mr. George Culley.
	Salop - - -	Mr. Bishton of Killsfall.
30	Stafford - - -	Mr. William Pitt of Pendeford.
	Monmouth - - -	Mr. Fox.
	Hereford - - -	Mr. Clarke.
	Gloucester - - -	Mr. Turner of Dowdeswell.
	Derby - - -	Mr. Brown of Luton.
35	Notts - - -	Mr. Lowe of Oxtou.
	Cumberland - - -	Mr. Bailey, and Mr. George Culley.
	Westmorland - - -	Mr. Pringle of Balencriff.
	Worcester - - -	Mr. Pomeroy of Fairway, near Honiton.
	Lancaster - - -	Mr. Holt of Walton.
40	East Riding, Yorkshire	Mr. Leathem.
	North ditto - - -	Mr. Tuke, jun.
	West ditto - - -	Mr. George Rennie, Mr. Brown, and Mr. Shirreff.

WALES.

	Pembroke - - -	}	Mr. Haffal.
	Carmarthen - - -		
45	Cardigan - - -	- - -	Mr. Lloyd, and the Rev. Mr. Turner.
	Radnor - - -	}	Mr. Clarke.
	Brecon - - -		
	Glamorgan - - -	- - -	Mr. Fox.
	North Wales - - -	- - -	Mr. George Kay.

SCOTLAND.

50	Berwick - - -	- - -	Mr. Low, and Mr. Bruce.
	East Lothian - - -	- - -	Mr. Buchan Hepburn.
	Mid Lothian - - -	- - -	Mr. George Robertson of Granton.
	West Lothian - - -	- - -	Mr. James Trotter.
	Dumfries - - -	- - -	Dr. Bryce Johnston of Holywood.

	COUNTY.	PERSON.
55	Galloway, both county and Stewartry - - -	Mr. Webster.
	Ayr - - - -	Colonel Fullarton.
	Dunbarton - - -	Reverend Mr. Ure.
	Renfrew - - -	Mr. Alexander Martin of Salton.
	Argyll, and Western coasts of Inverness - - -	Mr. Robson.
60	The Hebrides, or Western Islands	Rev. Dr. Walker, professor of natural history in the University of Edinburgh; and Mr. Heron.
	Stirling - - -	Reverend Mr. Ure.
	Clackmannan - - -	Mr. Erskine of Marr.
	Roxburgh - - -	Reverend Mr. Ure.
	Selkirk - - -	} Mr. Thomas Johnston.
65	Tweeddale - - -	
	Clydesdale - - -	Mr. John Naismith.
	Carle of Gowrie - - -	Mr. James Donaldson.
	Monteath and Strathearn in Perthshire - - -	Rev. Dr. Robertson of Callander.
	Kinross - - - -	Dr. Coventry, professor of Agriculture in the University of Edinburgh.
70	Fife - - - -	Mr. Beatson of Lochgellie.
	Forfar - - - -	Mr. Dempster of Dunnichen, and the Rev. Mr. Roger.
	Mearns - - - -	Mr. Barclay of Urie, and Mr. James Donaldson.
	Aberdeen - - - -	Dr. Anderson.
	Banff, - - - -	} Mr. James Donaldson.
75	Moray - - - -	
	Nairn, and eastern part of Inverness - - -	} Mr. Marshall, author of the Norfolk Husbandry, &c.
	Interior districts in the High- lands.	
	Ross, Sutherland, and Caithness - - -	} Sir John Sinclair.
	Orkney Isles - - -	
80	Shetland Isles - - -	

As the Reports transmitted to the Board are to be printed, and very generally circulated, in the counties to which they respectively relate, previously to their being published, there is every reason to believe, that no material error can escape observation, and that every useful fact, or valuable idea, existing in the kingdom, on the subject of agriculture, will be brought forward.

A copy of the returns transmitted by the different surveyors (or the one that respects any particular county,) will be sent to the Members of both Houses, on application to the Board, by a letter directed to Sir John Sinclair, the President, at Whitehall, London. It is requested that such application may be made as quickly as possible (*as the number of copies to be printed, must be settled accordingly*), and that a direction be sent at the same time, how the papers are to be addressed.

APPENDIX. G.

Account of the Manner in which the Parliamentary Grants received by the Board of Agriculture, prior to the 4th of September, 1796, have been expended.

N.B. An additional 3000l. was voted in April, 1796, but it was not paid on the 4th Sept. following.

	£.	s.	d.
Fees on the Letters Patent, constituting			
the Board - - - -	£713	1	0
Fees on receipt of the grants - - - -	477	11	2
			} 1189 12 2
Expence for the Surveys of the different counties	2171	3	6
Printing the Surveys, and engravings therein contained	3411	2	6
Postage and other incidental charges - - - -	255	6	11
Office furniture, and articles for the museum - - - -	118	19	6
Stationary - - - - -	106	14	1
Salaries to officers - - - - -	1660	0	0
Advertisements - - - - -	77	12	4
German translations - - - - -	9	9	0
	£9000 0 0		
	For		

For so great an undertaking as the Survey of a whole kingdom (without adverting to the various other objects to which the attention of the Board has been directed), so small a grant as 3000*l. per annum*, particularly deducting so large a sum as 1189*l. 12s. 2d.* for fees of office, would have made no progress, had not about one hundred Members of the Board subscribed ten guineas each, in aid of its other funds,—had not the President supplied the Board with every accommodation that was necessary for carrying on its business, without putting it to any expence, and had not a number of individuals either gratuitously assisted the Board in drawing up the County Reports, and other papers, or executed the different tasks entrusted to them, on the most moderate terms.

It is hardly necessary to add, that none of the Members of the Board, can possibly derive the smallest advantage, from the labour they bestow in conducting the affairs of the Institution, though in a late publication an insinuation to that effect has appeared.*

* See Additional Facts on the expences of the War, &c. by William Morgan, F.R.S. p. 52. “The Secretary and Under-secretary to the new Board of Agriculture (he observes) receive a salary. The Commissioners, (he adds) I believe, for the most part officiate gratuitously.” The fact is, that all the Commissioners, as he is pleased to call them, officiate gratuitously; and that the President, instead of receiving any thing, incurs an expence of at least 1000*l. per ann.* in consequence of the situation he holds, which, at the same time, is probably the most laborious of any in the kingdom. In regard to the small pittance granted by Parliament, it is to be remarked, that the greater part of it will be returned to the public and its officers, in fees of office, in postage, in duties on advertisements, but above all in duties upon paper, which, when all the Reports are reprinted, will amount to a very considerable sum.

APPENDIX. H.

Substance of Sir John Sinclair's Address to the Board of Agriculture, on Tuesday the twenty-ninth of July, 1794: stating the Progress that has been made by the Board, and the Advantages that may be expected from improving the Territory of the Kingdom.

THAT he considered it extremely necessary, for any person who filled that situation in which he happened to be placed, previous to the Annual Adjournment of the Board, to give a short statement of the business which had been transacted in the course of the Session, and of the progress that had been made in carrying on the important objects for which the Board was constituted.

That at the commencement of the present, being the first session after its establishment, the attention of the Board had naturally been directed to the formation of those bye-laws which were to regulate its future proceedings, the original sketch of which had been drawn up with great attention and ability, by a Noble Lord (Lord Hawke), to whose zeal and assiduity the Board, in that and in other respects, had been infinitely indebted.

That a great variety of important communications had been transmitted to the Board from many quarters, both at home and abroad, on all the different topics connected with agricultural inquiry, furnishing a number of valuable hints, which might be of essential service in promoting the improvement of the country. These hints, he observed, might either be separately printed, or incorporated with the Reports of the Board. That the committee appointed "to take the Present State of the Waste Lands, and Common Fields of this Kingdom, and the probable Means of their Improvement, under their con-

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sideration,"

sideration," had already made great progress in that important inquiry, and he had no doubt, would, when the Board re-assembled, have a Report ready, fully explaining the ancient laws respecting the division of such lands, and the best means of facilitating them in future; and that the Board was already in possession of a very interesting and able paper, drawn up by one of its members (John Robinson, Esq. surveyor-general of the woods and forests), which had thrown much light upon that subject.

Above all, that the progress made in the Agricultural Survey of the Kingdom (the basis of all the measures which the Board might think it advisable to recommend to the attention of the public) had surpassed the most sanguine expectations. The whole kingdom had been assigned in districts to different surveyors, from each of whom a separate Report was required. Such a plan had never been formerly attempted in any country; and many doubts were entertained whether it would be possible to effect it even in Great Britain, in any reasonable space of time. He had the pleasure, however, of acquainting the Board, that seventy-four Reports had been already given in, and were either printed or now in the press, and that the remainder were in such a state of forwardness, that they might soon be expected; and, consequently, within twelve months from the Establishment of the Board, this great object would be completed. That to the credit of the Gentlemen who engaged in this laborious undertaking, a considerable number of them would accept of nothing for their trouble, and the remainder were satisfied with sums, in general, scarcely adequate to the expences they had incurred. That the Reports they had given in, were not to be considered as complete Systems of Husbandry, but merely as Chapters of a Great Work, distributed at present, as affording the readiest means of collecting farther information. That the circulating of 80,000 Papers, on so popular a subject as that of Agriculture, must have a strong tendency to direct the public attention, in a very peculiar manner, to that object; which, indeed, had already sufficiently appeared, from the anxiety to procure those Papers, and from the demand which had lately arisen for Works on
Agriculture.

Agriculture.—That about 100 Reports had been already received back, the margins of which were filled with many valuable hints and observations. That he had no doubt a considerable number of the Reports in circulation would be returned with remarks of equal merit. The Board would thus have under its inspection at once, not only very interesting accounts of the present State of the Kingdom, and a complete collection of all the past skill and experience of which the country was possessed, in matters of Husbandry, but probably every suggestion that the kingdom was master of, respecting the means of its future improvement: “a mass of useful information, of which it cannot with justice be asserted, that any other nation has ever yet been possessed.”

In regard to the use that ought to be made of the information thus accumulated, by the labour and exertions of so many active and intelligent Individuals, there are two points which he begged leave to submit to the consideration of the Board. First, that they ought not to suffer the public attention to waste itself, previous to their communicating that information to the Country; and, secondly, that instead of frittering away the valuable treasure they have thus obtained, in partial Reports, they should endeavour to condense it into one great system; and in order that the General Report might not be drawn out to too great a length, it is proposed that an Appendix shall be annexed to each chapter, for the purpose of containing a number of facts and observations, which, though tending to illustrate the subject treated of, might, in the opinion of some, be considered of a less interesting nature.

That besides the General Report, it would be expedient to reprint and to publish, the various Agricultural accounts now in circulation, with every possible correction and improvement, and in such a form, that every individual may have it in his power to purchase, on reasonable terms, either the account of his own particular county, or the Reports relating to all the different counties, or the General Report on the State of the Kingdom at large, as he may find most desirable.

He could not conclude, without attempting to give, even in this early stage of their proceedings, some general idea of the public benefit to be derived from the improvement of the territory of the country.

It is not difficult, even on such data as have been already obtained, to make calculations sufficiently accurate for every useful purpose, respecting the probable advantages to be expected from the improvement of the kingdom, in regard to income—capital—and population: and perhaps a short statement of such advantages, may awaken more the public attention, and be more satisfactory to the generality of the people, than long disquisitions. He had, therefore, embraced the earliest opportunity, of throwing together some ideas upon the subject, for his own private satisfaction, and for the consideration of the Board and of the public.

Of the different Reports given in to the Board, that from the county of Cambridge is by far the most minute, the surveyor having, with great labour, gone from parish to parish, and in general having obtained sufficient information, in regard to stock, produce, and population. At the conclusion of his Report, he recapitulates the increase of rent which may be expected, by improving the cultivation of 319,300 acres in that county, of which the following is an abstract.

Number of Acres.	Description of the Land.	Increased Rent per acre.	Total Increase.
150,000 -	Waste and unimproved Fen - -	£ 0 10 0	£ 75,000 0 0
132,000 -	{ Open and Common Field Arable } Land - - - - }	0 8 0	52,800 0 0
19,800 -	Inferior Pasture - - -	0 9 7	9,487 10 0
7,500 -	Of Upland Common - - -	0 11 0	4,125 0 0
8,000 -	Of Fen Common - - -	0 10 0	4,000 0 0
2,000 -	Of half yearly Meadow Land -	0 8 6	850 0 0
319,300 -	At an average about 9s. per acre.		£ 146,262 10 0

That it seemed to him impossible to contend, that these rents are exorbitant, or beyond what any tenant would be willing to pay for the advantage of having his land drained, inclosed, and put in a state of improvement. This seems, therefore, a fair foundation, on which the following calculations may be built.

That

That the above increased rent, it is evident, can only arise from increased produce, or decreased expences, but principally from the former; and it is not unreasonable to say, that the tenant ought to have of increased produce alone, thrice the increased rent, or in the county of Cambridge, deducting smaller sums, 438,000*l. per annum.*

That to prove this is a low calculation, it is sufficient to remark, that stating the additional produce of 319,300 acres at 438,000*l.* is only at the rate of about 1*l.* 7*s.* per acre, which surely cannot be called too high an estimate.

That in order to judge what addition this would make to the national capital, the increased produce ought to be multiplied by thirty;—hence the total value, at thirty years purchase, would amount to 13,140,000*l.*

That in the view of additional population, the result is equally satisfactory. According to the common calculation, 10*l.* at an average, is sufficient for every human being, men, women, and children included; consequently 438,000*l.* of additional produce would furnish subsistence to 43,800 additional inhabitants.

The general result, in regard to Cambridgeshire, is then as follows:

Number of acres to be improved,	-	319,000
Addition of rent, at the average of about 9 <i>s.</i>		
per acre,	-	£146,262
Additional produce, at 1 <i>l.</i> 7 <i>s.</i> per acre,	-	£438,000
Addition to the national capital, at 30 years		
purchase of the produce,	-	£13,140,000
Probable increase of population,	-	43,800 souls.

That, for the purpose of calculating the extent to which improvements may be carried in the kingdom at large, it is necessary to state, that according to the computation of the celebrated Dr. Halley, Cambridgeshire is a 70th part of England and Wales, consequently the above results are to be multiplied by seventy, in order to ascertain the improveable value and population of the southern part of the United Kingdom. The result of that calculation would be as follows:

Number of acres to be improved,	-	22,351,000
Addition of rent, at the average of about 9s. per acre,	- - - - -	£10,057,950
Additional produce, at 1 <i>l.</i> 7 <i>s.</i> per acre,		£30,173,850
Addition to the national capital, at 30 years purchase of the produce,	- - -	£905,215,500
Probable increase of population,	-	3,017,385 souls.

That of the number of acres to be improved, namely, 22,351,000, one half probably consists of waste lands, and the other half of common fields, and lands under defective cultivation; and that great as would be the benefit to be derived from the improvement of the former, it was the latter from which the greatest expectations of solid advantage were to be entertained.

That doubtless there would be some, who, unaccustomed to such calculations, or perhaps from despondency of temper, might be inclined to question them. They may probably say that one district is too small a foundation, on which to build so great a superstructure: that Cambridgeshire has an unusual proportion of wastes and common fields, and consequently cannot furnish fair data for such a calculation, &c. &c. To this it may be sufficient to answer, that in such cases, minute exactness is not to be looked for. That to be enabled to form some general idea of the nature and extent of public improvement, is a great step gained.

That from every information which the Board of Agriculture has as yet been able to procure, there are at least twenty-two millions of acres, partly waste, and partly already in cultivation, which may be made to yield an additional produce of 1*l.* 7*s.* per acre. That the above calculations are confined to South Britain; and that one-sixth more, at least, might have been added for North Britain, had there been any wish to make exaggerated estimates; and that as much of the additional produce will consist of wool, hides, and other raw materials, which will employ many hands, and the value of which will be trebled by being manufactured, it is impossible that the above statement can do justice to the additional wealth
and

and population of the country, resulting from a general improvement of the soil; more especially, when the improvement of the live stock in the kingdom is taken into consideration, from which so much additional advantage may be expected.

Another objection which may be urged, is, that no deduction is made on account of the expence of these improvements.—That is undoubtedly a circumstance entitled to the attention of those private individuals, by whom such improvements are to be made; but in a national account, it is not an object for consideration. The public pays for none of these improvements: though John should employ Thomas to survey a waste, to inclose a common field, to build a new house for a farmer, or to raise new plantations, the public, instead of losing, would gain by the expenditure. The money thus laid out, might have lain dormant in the coffers of a banker, might have been wasted on foreign luxuries, might have been employed in manufacturing articles for foreign markets, which were never paid for; or might have been destined for the cultivation of distant territories, with all the risk of being taken from us by an enemy, on declaring themselves independent. How different is the result, when our money is laid out at home, and employed in a manner, in every possible point of view, so peculiarly beneficial. The improvements of our own land cannot be taken from us. They require no additional troops to defend them, nor fortresses to be reared for their protection. But if any person should incline to consider the money expended in carrying on the amelioration of our own soil, as so much national loss, let him state the expence at the sum of 4*l.* per acre, which is certainly sufficiently high, (for the first crops, after any field is improved, are in general so luxuriant as to repay all necessary expences) and even then, ample inducements for improving will still remain.

The expence of improving 22,351,000 acres, at 4 <i>l.</i> per acre, would amount to	-	-	£89,404,000
Interest thereof at five <i>per cent.</i>	-	-	£4,470,200

These sums are to be deducted from 905,215,500*l.* of additional national capital, and 30,173,850*l.* of additional national income.

That here it was impossible not to advert to the astonishing difference between expending eighty-nine millions in improvements at home, or in foreign conquest. After the expenditure of that sum in war, it would be accounted a most fortunate means of reimbursement, if we could secure any territory, by a commercial intercourse with which five millions *per annum* could be gained; whilst, at the same time, it would be necessary to pay at least five millions of additional taxes. But if that money were laid out at home, or rather, if private individuals were encouraged to expend a part of their wealth and capital in the internal improvement of the country, instead of new taxes being necessary, the old ones would become lighter, and more easily paid, and instead of dragging five millions *per annum*, from an enormous distance, and consequently with much risk and expence, thirty millions would be produced within our own domain, and always at our command. That these were truths which had been often vaguely talked of, and consequently made little impression, but which were now likely to be probed to the bottom, and established beyond a doubt.

He should conclude with remarking, that, with such a prospect of public prosperity resulting from the labours of the Board, he was persuaded every member of it would persevere with alacrity and zeal, in completing the great undertaking in which they were engaged: the effect of which would be felt and remembered, whilst any vestige of civilization, of useful industry, or of political happiness, could be traced in Europe*.

APPENDIX.

* The following is an abstract of the Agricultural State of Warwickshire (known to be one of the best cultivated counties in England), as reported to the Board of Agriculture,

Land

APPENDIX. I.

Substance of Sir John Sinclair's Address to the Board of Agriculture, on Tuesday the 14th of July, 1795.

Stating the Progress that had been made in carrying on the Measures undertaken by the Board, for promoting the Improvement of the Country, during the second Session since its Establishment.

Ye generous Britons, venerate the plough ;
 — So with superior boon may your rich soil,
 Exuberant, Nature's better blessings pour
 O'er every land, the naked nations clothe,
 And be th' exhaustless granary of a world !

THOMSON'S SPRING.

THAT he could not think of their separating for the summer, without laying before the Board, according to the prac-

	<i>Acres.</i>
Land in tillage—Wheat, 25,700—Fallow, 15,000—Turnips and Vetches, 15,000—Barley, Oats, Beans, &c. 41,500—Tillage lands grazed, 45,000—Ditto in Grass and mown for Hay, 12,330. Total	154,530
Gardens, 4000—Meadows, 82,000—Woods, Canals, and Rivers, 50,000	136,000
Roads supposed to be	10,470
Open fields, 57,000—Pasture and feeding lands, 150,000—Waste lands, 110,000	317,000
	618,000

On the supposition that only 1*l.* 7*s.* could be obtained from 317,000 acres of improveable land, and 10*s.* of additional produce from 154,530 acres under tillage, which might certainly be expected from abolishing fallows, &c. the result would be, 505,215*l.* and as Warwickshire is a 60th part of England and Wales, the total additional produce of the southern part of the kingdom would, on that supposition, be 30,312,900*l.* per annum,

tice

tice of last year, an abstract of their proceedings, at the conclusion of what ought properly to be accounted their second Session, only one meeting having been held in 1793, when the Board was originally constituted.

That nothing could give him greater satisfaction, than to observe the progress which the Board was making, towards completing the great measure which it had at first undertaken, namely, that of ascertaining the present State of the Agriculture of these kingdoms, and the Means of its Improvement. That not only the rough draught of the Survey of each County, with hardly any exceptions, (and those would soon be supplied,) had been printed, but that the printing of the Reports had also commenced, from which it would appear what progress had been made in collecting additional information. The reprinted Report of Lancashire, which was now ready for publication, would fully explain the Plan according to which those Reports were in future to be drawn up. From an examination of that Report, the public would see, to what a pitch of perfection, Agricultural knowledge was likely to be brought, by the accumulation of so many valuable materials.

That next to collecting information, the Board was naturally anxious, to excite a spirit of improvement; a spirit which could best be roused, by pointing out to the Legislature those obstacles which prevented Agricultural industry, and by endeavouring to prevail upon Parliament to remove them. When the Reports were completed, it might be expedient for that purpose to draw up an Abstract of the whole, adhering to the division by Counties, but restricting the information to those points which were of general importance. That Report, which it would be proper to lay before his Majesty and both Houses of Parliament, would state such measures as seemed to be the most likely to rouse a spirit of Agricultural Exertion. He hoped that important work would be completed, before the ensuing Session of Parliament was brought to a conclusion.

The third object, that of drawing up a General Report, in which each subject connected with Agriculture should be distinctly

tractly treated, had also made considerable progress. Several of the chapters were already drawn up; and the Fifteenth Chapter, on the great subject of Manures, was printed, and in circulation. That Chapter fully explained the nature of the proposed Report, and the manner in which it was intended to be executed.

Among the duties of the Board of Agriculture, there was none of more real importance, than that of bringing under the consideration of Parliament, such measures as were likely to promote the interests of every description of persons connected with husbandry, more especially those of the lower orders of Society. With that view, a Bill was brought into Parliament, on the recommendation of the Board, which had passed into a Law, and was likely to prove of much consequence to that valuable class, the Common Labourers, who were entitled to the peculiar attention of the Legislature, and to the protection of the Board, in enabling them to lay out their little pittance to the best advantage, and without the risk of imposition*.

That a most important, but at the same time a very delicate branch of duty, incumbent upon the Board, is that of submitting to the consideration of Parliament, the claims of those, who merited to be rewarded, on account of discoveries advantageous to Agriculture. That any attempt of that sort, it might easily be supposed, was liable to many difficulties. That the Board had succeeded, in its first application, in behalf of a very deserving individual, Mr. Joseph Elkington, who had carried the art of Draining Land to a perfection hitherto unknown, and which, if spread over the whole kingdom, must necessarily prove the source of infinite public benefit. That sum, being the first ever granted by Parliament for any discovery of importance to Husbandry, rendered it more valuable

* This Act, which was recommended to the attention of the Board by Sir Christopher Willoughby, one of its members, and was introduced into Parliament by Mr. Powys, is intitled, "An Act for the more effectual Prevention of the Use of defective Weights, and of false and unequal Balances."

to the person who received it, and more creditable to the Board, in consequence of whose recommendation it had been obtained. That the Board had this day appointed a Committee, for the purpose of attending to that subject, during the recess; by whose exertions, he had no doubt, considerable progress would be made, in the course even of this year, in having those individuals taught, who might be sent with that view to Mr. Elkington.

That there is no duty more incumbent on a Board of Agriculture, than that of recommending such measures, as are the most likely to provide a sufficient quantity of food for the People: recommendation, it is well known, is all that a Board possessed of such limited powers can attempt; but in that respect, it fortunately seems to be possessed of considerable influence. The deficiency of the last crop, becoming too apparent at the commencement of this year, an Extraordinary Meeting was held to take the subject into consideration, when the Board resolved, to recommend the Culture of Potatoes, as in every point of view the resource the easiest to be obtained, and the most to be depended on. By accounts received from various parts of the Island it appears, that the recommendation had been attended with the best consequences. There is every reason to believe, that perhaps 50,000 additional acres of Potatoes, have been planted in consequence of that recommendation. As each acre of Potatoes, will feed, at an average, from eight to ten people for twelve months, it is probable that the Board have been the means of raising as great a quantity of that food, as will maintain nearly a million of people for six months, and consequently it will have been the happy instrument, of preventing the risk of scarcity or famine during the ensuing season. For the purpose of increasing that culture in future, and of ascertaining the principles on which it could best be conducted, a Report has been drawn up and printed, which contains all the information that could be collected in Great Britain or Ireland, and from foreign publications, on the subject of Potatoes.

That for many years past, constant complaints have been made, of the increasing price of provisions. Many causes have

have been assigned for such a circumstance, and many remedies suggested; but the most effectual one undoubtedly is, that of cultivating the many millions of acres now lying waste and unproductive. That to that point he should take the liberty of calling the attention of the Board early in the course of the ensuing Session; and in the interim he trusted, that the members of the Board would pay every possible attention to the subject.

“ Let us cut off those legal bars,
 “ Which crush the culture of our fruitful Isle.
 “ Were they removed, unbounded wealth would flow,
 “ Our wastes would then with varied produce smile,
 “ And England soon a second Eden prove.”

The last, and perhaps the most important object, to which the attention of the Board can be directed, is that of attending to the situation and circumstances of the lower orders of the people. That important branch of our duty had not been neglected during the course of the present session. In addition to the specific measures above alluded to, a Special Committee was appointed to take the general subject into consideration, who have laid the foundation, by their investigations, for very important regulations in regard to that great branch of political economy. A matter of that importance, however, requires much deliberation, before either Parliament can be applied to for new laws, or any recommendation can be submitted to the consideration of private individuals. But there were three points, which seemed to meet with a very general concurrence. The first was to promote Improvements in the Construction of Cottages, more especially to ascertain the means by which the consumption of fuel could be diminished. The second, to recommend the annexing of a large garden to each cottage, by which the labourer, with the assistance of his family, might be enabled to raise a considerable quantity of provisions, without being obliged to go to market for every thing he had occasion for. * Many instances of the benefit resulting from such an appendage were stated in the
 different

different County Reports, and were known to many members of the Board. The third point was, that of encouraging, by every possible means, the Extension of Friendly Societies, that most fortunate of all institutions for the benefit of the poor, and the most likely means, that could possibly be devised, for rendering their situation comfortable.

That the variety of important subjects, regarding which it was necessary for the Board to collect information, and of measures which it might have occasion to recommend to the public attention, having rendered it extremely desirable, to establish a correspondence with some respectable body in each county, it had occurred, that either the Grand Juries, or the Magistrates assembled at the quarter sessions, were in every point of view, the fittest and most respectable description of persons for the Board to correspond with. That a circular letter had been sent by the Board, suggesting the many public advantages that might be derived, by establishing a Committee of the Magistrates in each county, to correspond with the Board upon such subjects, which there is every reason to believe will be cordially acceded to; a most desirable circumstance, as such an intercourse could not fail to be productive of consequences equally satisfactory to the Board, and important to the general interests of the country.

The President then concluded his Address in the following words:

On the whole, the Board have only to persevere, with zeal and alacrity, in the great course in which they are now engaged, in order to effect objects, which were never compassed in any other country; and which, without an institution, carried on with such zeal and energy, would never have been supposed attainable. And in carrying on this great undertaking, we ought to consider, that we are not only labouring for ourselves and our posterity, and for the nations by whom we are surrounded, who must profit from our instructions, and be benefited by our example, but that we are laying a foundation for the future prosperity and happiness of the human race; since their prosperity and happiness must ever depend, on the facility

lity with which their means of sustenance can be provided. This country has much to boast of.—In the arts of war it has had few equals : in commerce and manufacturing industry, it has gone beyond all competition : in every branch of learning it has produced individuals, who can rival the proudest names that antiquity can exhibit : *and if, in addition to these other sources of fame and credit, it can bring Agriculture, and the useful arts connected with it, to perfection, (which by the exertions of this Board can hardly fail to be speedily accomplished,) where is the nation that will be able to make a more distinguished figure in the page of history ?*

APPENDIX. K.

*Sir John Sinclair's Address to the Board of Agriculture,
on Tuesday the twenty-fourth of May, 1796.*

*Stating the Progress that had been made by the Board, during the
third Session since its Establishment.*

Igitur et de cultura agri præcipere, principale fuit, etiam apud exteros; siquidem et reges fecere, Hiero, Philometor, Attalus, Archelaus, et duces Xenophon, et Pœnus etiam Mago; cui quidem tantum honorem senatus noster (Romanus) habuit, Carthagine capta; ut cum regulis Africæ bibliothecas donaret, unius ejus duo de triginta de agricultura volumina, censeret in Latinam linguam transferenda, cum jam M. Cato præcepta condidisset, peritisque linguæ Punicæ dandum negotium, in quo præcessit omnes vir clarissimæ familiæ D. Syllanus.

PLIN. Hist. Mund. L. XVIII. c. 3.

GENTLEMEN,

AS it will probably be extremely difficult to procure again a sufficient attendance of the Members of the Board, at this season of the year; and during the bustle of a general election, I think it may not be improper, to take the opportunity of this meeting, briefly to state the progress we have made, since I last had the honour of addressing myself to you, at the conclusion of the preceding session.

It is on all hands acknowledged, that the exertions of the Board of Agriculture last year, in promoting an extra cultivation of potatoes, was attended with the happiest consequences, the beneficial effects of which (both the culture and use of that valuable root having thus been greatly extended) will probably long be felt, when the circumstance from which it originated

originated may be forgotten. In fact, in times of scarcity, and distress, there is no article comparable to Potatoes.—They will grow in the poorest soils; they can be taken up in detail as they are wanted; they require no manufacture of drying, milling, &c. previous to their being used; and they can be prepared in various ways for consumption. Above all, it is to be observed, that there is a space of perhaps four months, which generally is supplied from the old stock, but in times of scarcity must be taken from the new crop. That is a circumstance of less consequence where spring corn is the food of the people (but even there it is desirable to thrash the corn in winter rather than in spring, as the straw is better for the cattle): but where the people live upon wheat, which is sown in autumn, the case is otherwise; and it is impossible to say what distress it might occasion (when there is no old stock of wheat in the country) unless the aid of such an article as Potatoes can be obtained, if the farmer is obliged, in a hurried and destructive manner, to thrash corn, both for seed to himself, and food for the public. He might be tempted indeed, by the high price of grain for food, to delay sowing his seed, until the favourable season has elapsed, in which case it is impossible to say what damage would ultimately result from it.

The Board not having yet obtained the privilege of franking, its correspondence is much more limited, and less regular than it ought to be, and is attended with a degree of trouble and inconvenience to the person who presides at it, of which it is difficult to form an adequate conception. In consequence, however, of the want of this privilege, so essential to a public institution, and the great restrictions recently imposed upon the privileges enjoyed by a Member of Parliament, it has been found impossible to keep up that extensive and regular correspondence, and to produce that extent of information, from which the public might derive so many important advantages. By the active zeal, however, of many friends to the institution, information was at a very early period sent to the Board, containing rather unfavourable accounts of last year's crop of wheat. I thought it a duty,

therefore, incumbent upon me, to make use of every degree of influence, which my situation, as President of this Board, gave me with the public, to recommend, in the strongest manner, an extra cultivation of wheat last autumn. My letter upon that subject, dated 11th September, 1795, was sent to all the Members of the Board, was transmitted to the quarter sessions of the different counties, and was printed in above fifty different newspapers. It is with much pleasure I add, that the recommendation was attended with more extensive consequences than could well have been expected. From all parts of the kingdom, intelligence has been received, that a greater quantity of wheat was sown last autumn, than perhaps at any period in the memory of man; and should the ensuing harvest prove favourable, this kingdom will be as well stocked with grain as it was some years ago. At any rate, by these measures, much risk of an immediate scarcity seems to be obviated.

The high price of corn, at the commencement of the last session, naturally directed the attention of Parliament, to consider the best means, not only to remedy the present distress, but to prevent it in future.—For attaining the first object, a Select Committee was appointed, known under the name of the Corn Committee, whose anxious zeal to do every possible justice to the great subject referred to their consideration, merits the utmost praise. The measures recommended by that Committee, have since been considered unnecessary by some individuals, in consequence of the price of grain having had a temporary fall.—But it will probably yet appear, that had it not been for the earnest recommendation of that Committee, to economize the consumption of bread, to use other kinds of grain as substitutes for wheat, and to encourage the importation of foreign corn by bounties of uncommon magnitude, the price of grain would not probably have decreased, and complaints would have been made of the inattention of Government to the distresses of the country. A more serious ground of accusation than an over anxiety, which, at all times, particularly in regard to so critical a matter as the subsistence of the people, is at least excusable, but on the present occasion,

occasion, was not only necessary, but has proved extremely beneficial.

It was a matter, however, of still greater importance, to prevent, by some great and effectual measure, the risk of scarcity in future, and our being under the disgraceful and fatal necessity, not only of depending upon foreign grain for our subsistence, but also of encouraging its importation by high bounties. With that view, in consequence of the directions of this Board, I had the honour of moving in Parliament, for the appointment of a Select Committee, to take into its consideration the means of promoting the cultivation and improvement of the waste, unclosed, and unproductive lands of the kingdom. The passing of a general bill of inclosure, though long ardently wished for, has hitherto been attempted in vain, and by many was held to be impracticable. By the exertions, however, of the Select Committees, to whom the drawing up the bill, and the consideration of the whole subject was referred, a bill has at last been prepared, which, in the opinion of many intelligent persons, conversant in that subject, is fully adequate to the object in view: and had not the last session been closed rather earlier than was expected, it would probably have received the sanction of the Legislature this year. I trust, however, that the first session of the ensuing Parliament, will have the credit of completing this important and valuable system, on which the future subsistence of the country depends. It is not likely at least to fail, if it can be effected by the Board of Agriculture.

Another measure recommended by the Board, of infinitely less importance, but at the same time beneficial to the agricultural interests of the country, has already passed. I allude to the exemption of linseed and rape cakes from duty, by an act of last session, 36 Geo. III. cap. 113 *. The first ar-

* Intituled, An Act for allowing the importation of Arrow Root from the British plantations, and also of Linseed Cakes and Rape Cakes from any foreign country, in British built ships, owned, navigated, and registered according to law, without payment of duty.

ticle, linseed cake, is of considerable importance to the feeders of cattle, and may be had, it is supposed, in abundance, from America; where a great quantity of linseed oil is made use of in painting their wooden houses. The refuse, known under the name of linseed, or oil cake, is of little value there, in consequence of the superabundance of other kinds of provision for cattle. Nothing would be more desirable, than thus to establish a new source of trade, beneficial to two countries, inhabited by a race of men, speaking the same language, descended from the same common origin, and who ought to consider themselves as the same people.—As to rape cake, it is found to be a valuable manure in many parts of this kingdom. Considerable quantities of this article, it is supposed, may be obtained from the continent of Europe; and since this regulation has taken place, rape will probably be cultivated in America. Were Russia also to devote some part of her boundless territories to the culture of that plant, the foundation of a commerce might be laid, advantageous to both empires.

In regard to collecting and circulating agricultural information, the true foundation of all those various improvements, which, under the auspices of the Board, will probably be effected, considerable progress has been made. The general views of the agricultural state of the different counties, with the exception of two small districts in Scotland (Clackmannan and Kinross), a part of each of which is already printed, have been completed. The corrected reports of Lancashire, Norfolk, Kent, Staffordshire, and Mid-Lothian, are published; and those of several other counties are almost ready for the press. A valuable addition has been made to the printed paper on Manures. The sketch of a Report on a point which has of late been much discussed, namely, the size of farms, has also been printed, and throws much light upon that subject. A valuable communication from Lord Winchelsea, on the advantages of cottagers renting land, was ordered to be printed, with the unanimous approbation of those who had the satisfaction of being present when that paper was read to the Board.

It is impossible in this short abstract of our proceedings, to give any idea of the numerous communications transmitted to the Board, or of the various points to which its attention has been directed. Its experiments in regard to the composition of bread, and information transmitted to it upon that subject, would of itself have been sufficient to have occupied the full attention of many Societies. The perfection to which the manufacturing of barley flour has been carried, under the auspices of this institution, is a discovery of great importance, as it is thus ascertained, that from the meal of pearl or pot barley, bread may be made, in taste and colour, and probably in nourishment, little inferior to that of wheaten flour; and that in the proportion of at least one-third, such meal may be mixed with the produce of wheat so as hardly to be distinguished. A very general correspondence has been established, for the purpose of ascertaining the price of stock, both lean and fattened. Experiments on a great scale, under the directions of that able chemist Dr. Fordyce, are now carrying on at Gubbins in Hertfordshire, the seat of Mr. Hunter, for the purpose of ascertaining the principles of vegetation, and the effects of manures; and steps are now taking, in order to procure such information respecting the various sorts of live stock in the kingdom, as will enable us to give, in the course of next year, complete information to the public upon that important subject.

I have ever considered it to be a wise principle for the Board to adopt, not to print books for reference, but books for use; not massy volumes on a variety of different subjects, beyond the income of the generality of the people to purchase, or their time to peruse; but, if possible, distinct publications, each of them on one article, exclusively of every other, avoiding the intermixture of various topics, and districts in the same work. It would also be desirable, that no paper should be published by the Board, until it has first been printed, circulated among all those who are likely to correct and improve it, and thus brought to some degree of perfection previous to its publication. Agriculture, though often treated of, has hitherto never been discussed; and it

can never be much improved, until information respecting it has been collected from all quarters, has been afterwards thoroughly canvassed, and has ultimately been condensed and systematized. Such, however, has been the great number of communications transmitted to the Board upon various important subjects, in particular Farm Buildings, Cottages, and the State of the Poor, Embankments, Roads, the Constructions of Mills, and of Hand-mills in particular; together with a variety of interesting papers respecting the agriculture of foreign countries, that the Board has resolved to print a specimen of those papers, in one volume quarto, in order to ascertain the opinion of the public respecting that mode of laying before it, the papers we have received, in addition to the County Reports now publishing.

The business gone through by the Board of Agriculture, is certainly more than could possibly be expected, from an institution possessed of such limited powers, and of so confined an income. The time, however, it is to be hoped, is not far distant, when it will be put on a better and more respectable footing.—When the superior importance of such inquiries, the superior value of agricultural resources, the dreadful expence, and fatal consequences occasioned by their deficiency, will be so clearly ascertained, as not to be a subject of doubt to the weakest understanding. For the purpose of effecting so desirable an object, I propose preparing, in the course of the ensuing recess, for the consideration of the Board, and if it should have the good fortune of meeting with their approbation, to be laid before his Majesty, and both Houses of Parliament, a General Report on the Agricultural State of Scotland, and the means of its improvement. That work will probably explain, in a satisfactory manner, the soundness of that political maxim, that the prosperity of a country ought to be founded, on a spirit of internal improvement, and that a single additional acre, cultivated at home, is more truly valuable, than the most extensive possessions acquired abroad, at an enormous expence of treasure and of blood, and retained with difficulty and danger. To that important subject, when hostilities are brought to a conclusion,

clusion, I trust that the attention of this country will be directed. Fortunately, by the exertions of the Board of Agriculture, when peace is happily restored, the internal state of this kingdom will be sufficiently ascertained, and we shall be able to judge, what are the fittest steps to be taken, in order to make the utmost of our domestic resources. To that period I look up with much anxiety. If Europe once more breathes in peace, and is governed by wise counsellors, the contest among nations naturally will be, not who will feel the greatest eagerness to rush again into the horrors of war, under the pretence of promoting national glory, but who will be the most anxious to remain in peace, for securing the national interests.

I cannot conclude, without expressing my best acknowledgments, for the assistance I have received from so many respectable Members, in carrying on the business of this institution. By their exertions, I trust, it will be brought to such a state, that from its establishment will be dated, not only the improvement and internal prosperity of our own country, but much of the comforts enjoyed in future times by society in general. Permit me to add, that when the Board re-assembles, each of us will, I hope, bring some proof of his zeal for the cause, by the additional information we shall respectively furnish. He who augments the stores of useful knowledge already accumulated, whilst he secures to himself the most satisfactory sources of enjoyment, promotes at the same time, in the most effectual manner, the happiness of others.

APPENDIX. L.

Sir John Sinclair's Address to the Board of Agriculture, on Tuesday the 20th of June, 1797: stating the Progress that had been made by the Board, during the fourth Session since its establishment.

“ Between th’ Herculean straits, renown’d of old,
 “ And that new world whose earth is ting’d with gold,
 “ Britannia’s isle emerges in the west,
 “ Happiest of the islands, styl’d *The blest’d*;
 “ Heaven gave it softer skies, and milder air,
 “ And Nature nurs’d it with a mother’s care.”

GENTLEMEN,

IT being propos’d soon, to adjourn the usual meetings of the Board, for the remainder of the season, I shall now take the liberty, (according to the practice much approved of on former occasions of a similar nature,) briefly to state, the progress made by this institution, in the course of the present Session, the fourth, since the regular commencement of our proceedings.

The business of the Board may be considered, under the following general heads :

I. That of collecting, printing, and circulating Information, on Agricultural and other important subjects, connected with the Internal Improvement of the Country.

II. Of making, under the inspection of the Board itself, or a Committee of its Members, useful Experiments in Agriculture.

III. Of submitting to the consideration of Parliament, such Regulations, as may tend to promote the general Improvement

ment of the Country, and of recommending to its attention, such useful discoveries, of an agricultural nature, as may be entitled to public reward.

I.—In regard to collecting, printing, and circulating useful Information, it is impossible to conceive, that any institution could be more successful; and the progress made in the course of the present Session, has been truly satisfactory.

In the first place, the original Sketches of the County Reports *, without the exception of a single district in the united kingdom, have been completed; a work never before accomplished in any other country. Those Sketches were never meant for publication or sale, and are properly to be considered, merely as *printed manuscripts*, if such an expression may be used, intended to be circulated in the different districts, for the purpose of collecting additional facts and observations, with the assistance of which, a complete Report, respecting the husbandry of each county, might be drawn up, and laid before the Public. In their present state, however, they contain a great mass of valuable information in every branch of Agriculture; which, when we consider the small expence of its collection, does infinite credit, both to the public spirit, and to the agricultural knowledge of those, who assisted in the execution of so great an undertaking.

* The original County Reports which have been printed and circulated, were merely *sketches* or outlines, which were never intended to be preserved, when the corrected Reports were completed, a few copies alone excepted, as a matter of curiosity. It is not very liberal or candid, therefore, to make any invidious remarks on works of so temporary a nature. It would be as fair to judge of a future act, from a defective bill originally introduced into Parliament, making no allowance for the improvements it may receive in its progress through both Houses. At the same time, there is nothing like those sketches in any other language, taking them all in all, and considering each of them, not as distinct publications, but as chapters of a great work; and there is no collection of papers now extant, which any man of reading and reflection, would have more pleasure in perusing.

In the second place, considerable progress has been made in completing the corrected Reports of the different Counties; an object of a nature peculiarly important, and for the attainment of which no expence ought to be withheld. It appears from the public accounts, that Great Britain expended no less a sum than 34,296*l.* in making surveys of North America; and if we were only to lay out grants to a similar amount, in ascertaining the state of our own country, what important benefits might not be expected. The corrected Reports of the Agricultural State of Lancashire, Norfolk, Staffordshire, Kent, and Mid-Lothian, were printed last year. The following County Reports were ordered to be printed in the course of the present Session; namely, Suffolk, Somerset, Northumberland, Cumberland, Westmoreland, Roxburgh, and Selkirk; and many others are in such a state of forwardness, that in the space of less than two years, the whole will be ready for publication. By these Reports, not only the general state of the country will be explained, but, in the words of a respectable foreign honorary member, (Mr. Voght, of Hamburgh,) "we shall have collected the operations of an art which have been hitherto neglected in the routine of practical husbandry, or have been imperfectly communicated by tradition;" and many useful facts and observations will thus be rescued from oblivion, which otherwise might have been lost.

Should Parliament, after such a foundation, approve of making more minute inquiries regarding the population and statistical circumstances of the kingdom, for the purpose of having the real resources of the country, and the means of their improvement, *completely ascertained*, (objects greatly beyond the powers or the income of the Board at present to attempt,) with what a basis for extending our public prosperity would not Great Britain commence the ensuing century!

Here it may not be improper to allude to an idea that has been hinted at, that it would have answered equally well the object of such inquiries, to have carried them on, not by counties, but by larger districts; particularly where the agricultural practices were nearly similar, on the supposition that some trouble and expence might have been saved, and some repetitions

repetitions of the same accounts thereby prevented. Such a plan, however, would never have suited the extensive views for which the Board was constituted. Indeed, in place of County Reports, it would have been particularly desirable to have had returns from every parish in England, similar to those which are to be found in the Statistical Account of Scotland. That publication sufficiently proves the advantages to be derived from minute information, communicated from a variety of quarters. The greater number of persons employed in such an inquiry, and the greater number of districts they must separately report, give us a better chance of having the subject stated in every possible point of view, and a surer prospect of being enabled to form a complete system, by condensing, into a small compass, the substance of the great mass of information thus accumulated. Besides, though Agriculture is the most prominent, it is not the sole object of these inquiries. It is to be hoped that the Board will be enabled, from them, to draw up a general view, not only of the agricultural but of the political state of the kingdom; which could never have been effected, if the inquiries had not been carried on, according to those political divisions into which the country is distributed.

In the third place, considerable progress has been also made, in preparing materials for the General Report, on the most effectual means of promoting the improvement of the country, and meliorating the circumstances of its inhabitants; a work which will contain the result of all our inquiries, and from the publication of which such extensive and important benefits are to be expected. The printing of the first volume of the Communications to the Board, (which, with the County Reports, are merely to be considered as foundations for that important undertaking,) is almost finished. That volume must satisfy the Public on what an extensive scale our information is collected. Instead of printing a number of miscellaneous papers, on a variety of different topics, unconnected with each other, the Board has collected together all the communications sent to it respecting three separate points; namely, Farm Buildings, Cottages, and Roads; so that the reader has the same subject presented

presented to him in a variety of lights, and is not under the necessity of consulting a number of volumes for the information he may require; to these, a number of Foreign Communications will be annexed, which are extremely valuable. Indeed, it cannot be doubted that this country may become the centre of all information on agricultural and other useful objects of inquiry, if the Board should incline to carry on its foreign correspondence on an extensive scale.

In the fourth place, considerable progress has been made in collecting materials for the second volume of our Communications, in which it is proposed to explain all the various modes by which lands, in an unproductive state, can be improved, so as to be rendered capable of producing articles of considerable value. These improvements are, 1. *Clearing the Ground*, from trees, from shrubs, from stones, and from rubbish of every description, previous to its being brought into a state of culture. 2. *Inclofing*; a variety of modes for effecting which are practised in this country, which it would be proper to explain both by engravings and descriptions, so as to be rendered perfectly intelligible to every reader; and fortunately a paper on that important subject, has been already presented to the Board, by that intelligent correspondent, Robert Somerville, Esq. who has, on various occasions, conspicuously displayed his zeal in the cause of husbandry. 3. *Draining*; in a paper on which it is proposed to give a distinct account of all the various modes of draining land, with the drawings necessary to elucidate them. 4. *Manuring*; a subject on which the Board has already printed a great mass of valuable information, but to which many additional important communications are expected. 5. *Weeding*; a point respecting which Mr. Pitt, of Pendeford, (who is no stranger to botanical researches,) has sent us a valuable paper. 6. *Watering*; a paper on which may soon be expected from Mr. Davis, of Longleat, so celebrated for his skill in that important branch of husbandry. 7. *Embanking*; much valuable information respecting which has already been received from Sir Thomas Hyde Page, Mr. Beatson, an honorary member of the Board, Mr. Tatlow, &c. Lastly, *Planting*; a subject on which the Rev. Mr. Ure, who has paid particular
attention

attention to that source of improvement, is to favour us with a paper. These communications, I trust, will all be ready for the Second Volume of our Communications, and will be printed in the order above stated; so that both the Tenant and the Landlord, will have under their view at once, all the various modes of improving landed property; and indeed if the Board had only collected the information, which, I trust, will be found in those papers, it must have established its character for public utility, as at least equal to any institution hitherto known.

It would seem tedious to the Board, were I to attempt to give a distinct enumeration of the various articles respecting which communications have been already given in, or may be expected, against the period when the Board reassembles. It may not be improper, however, briefly to state some of the most important, namely. 1. *A paper on Instruments of Husbandry*, drawn up by Mr. Beatson, accompanied with all the necessary drawings, and a comparison between the different sorts. 2. *A paper on Mills*, which that intelligent engineer, Mr. Telford, proposes to present to the Board, illustrated with the explanatory Drawings, by which the proper construction of Machinery for grinding Corn, will be rendered infinitely more perfect, and more generally known, than it has hitherto been. 3. *A paper containing the Result of our Inquiries and Experiments, on alleviating the Distresses of the Poor, in Times of Scarcity*. The communications to the Board, upon that subject, were extremely numerous; and it is proper to arrange and to preserve them, in a situation easily accessible, in case a similar calamity should unfortunately again take place. 4. *Communications on the important subject of Live Stock*, containing not only the Natural History of the different kinds of domestic animals, but also particular descriptions of the different breeds in the kingdom; by means of which, that interesting subject will have a degree of light thrown upon it, which would not otherwise have been attainable. 5. *A Paper on the formation of Agricultural Societies*. Various applications have been made to the Board respecting such establishments, which, if spread over the kingdom, would greatly contribute to promote the objects

objects of this Institution. Lastly, as it is not to be questioned, that the improvement of a country must depend *on its Agricultural Legislation and Police*, it is with much satisfaction, I have the pleasure of adding, that against the period when the Board will reassemble, we shall have a Paper upon that subject laid before it, from a respectable author (Professor Ogilvie, of King's College, Aberdeen), which cannot fail to be acceptable both to this Board and to the Public.

I trust that this enumeration will make a deep impression on the mind of every Member of the Board, respecting both the great importance of the Institution to which he belongs, and the almost incalculable advantages which must be derived from it. It seems hardly practicable, to point out a greater mass of valuable matter, for the consideration of any body of men, or more important objects to which their attention can be directed; and when we shall have finished collecting and printing the labours of others, and shall have begun to publish works of our own, there is every reason to hope, that they will be distinguished by their superiority to any thing hitherto known on matters of this nature; and indeed, that *the General Report* upon those subjects, will form a kind of *Agricultural Code*, which posterity will consider to be the greatest boon, that this age and nation could have bequeathed to it*.

II.—The experiments hitherto tried by the Board of Agriculture, are restricted to those which are calculated to illustrate the

* The object of the whole inquiry, is to reduce Agricultural Knowledge into a regular system, at least to ascertain what is already known, and what is still wanting. When once the broad foundation is laid, of a Report from each County, regarding its peculiar practices, and distinct communications are printed on each particular subject connected with Agriculture, it will then be possible for the Board, to draw up such a Work, explaining not only the State of the Country, but the Principles of Agriculture in general, as cannot be equalled in regard to any other country, or any other art or science. That Work, I trust, will remain an eternal monument of so valuable an Institution, and will be remembered, as long as the cultivation of the soil is essential for the subsistence of the species.

important

important subject of Manures.—A Plan for that purpose, was recommended to the attention of the Board by Dr. Fordyce, and is now carrying into effect, at Gubbins, in Hertfordshire, the seat of Mr. Hunter. It is by far the most important measure hitherto attempted, for ascertaining the effects of different kinds of Manures, on the various sorts of vegetables. Two acres, peculiarly well calculated for the experiment, were pitched upon, and the surface of the one acre, being laid upon the other, there was thus an opportunity of trying experiments, with a new soil, consisting of sand and clay, and also with a soil which had been formerly manured and cultivated. The two acres have been divided in all into 192 beds, each containing 27 square yards, and in each of those divisions, a different experiment, either in regard to the soil, the manure, or the plant, is tried at the same time, and in similar circumstances in point of season and culture. The result (which must be extremely important to the science of Agriculture) will, from time to time, be laid before the Board. The experiments of this year, cannot be quite so complete and satisfactory as could be wished for, in consequence of the ravages of the wire worm. That circumstance, however, is the less to be regretted, as it was extremely desirable to ascertain what Plants the wire worm would not injure, and what are the best means to get rid of so troublesome and destructive a species of vermin.

III.—The General Bill of Inclosure, has been again submitted to the consideration of Parliament; and, to a certain extent, will probably receive the sanction of the Legislature, in the course of the present Session. By the Bill now in the Commons, which, in the course of a few days, will probably be carried to the Upper House, every legal disability to the division, the inclosure, and the holding in severalty, mixed property in land, of every description, is removed; and where the parties are unanimous, the object may be effected, notwithstanding a variety of legal bars, from nonage, &c. which now stand in the way of such division. This is a great step gained, and it lays the foundation for a general system of inclosure, which cannot

cannot fail very materially to promote the improvement of the country, and which would never probably have been accomplished, had it not been for the establishment, the exertions, and the authority of a Board of Agriculture.

CONCLUSION.

A VARIETY of circumstances tend to prove, that the establishment of a Board of Agriculture in Great Britain, (if the Institution shall be carried on with proper zeal and energy) will form an important æra, not only in the History of this kingdom, but of mankind in general. The attention shewn to the Agricultural Industry of this Country, has given additional consequence to that useful art in every other. The celebrated Washington has recommended the formation of a similar Board to the Congress of America, previous to his resigning the elevated situation, which he had held, for so many years, with such credit to himself, and advantage to the nation; and in every part of Europe, *the Children of the Plough*, are now considered, to be in a peculiar manner entitled to the attention of their respective governments. In fact, supplying a nation with food, is the first object to which every prudent statesman will direct his attention, as it is the foundation on which the whole structure of human society must rest. And when a Government encourages husbandry, not only a great body of its subjects are usefully employed, in that most desirable of all occupations, the healthful culture of the fields, but the inhabitants of the towns, are thereby furnished, with abundance of wholesome provisions, at a reasonable and steady price, and consequently, on that head, can have no just cause for complaint. To attain such important objects, nothing can be so effectual as the measures which the Board have pursued; namely, collecting and circulating useful information, ascertaining the Principles of Agriculture, by authentic and well conducted experiments, encouraging,

encouraging, by public rewards, useful discoveries, and removing those legal obstacles to improvement, which embarrasses the operations of the husbandman, and depresses his industry and exertions. It can hardly be questioned but that all these great objects may speedily be attained, under the auspices of the Board of Agriculture, if it receives that cordial support from the Public (so essential for its ultimate success), in carrying on that great Plan, towards the completing of which, it has already made such considerable progress *. In regard to

* The plan alluded to, is shortly this. It is proposed to publish,

1. A corrected Report of the present state, and local Agricultural practices, of every County in the United Kingdom.

2. Distinct Dissertations, or Collections of Papers, on each of the most important subjects connected with Agricultural Improvement; as Farm Buildings, Cottages, Roads, Inclosing, Draining, &c. and,

3. A General Report, the result of the whole inquiry, containing an Account of the Political Circumstances of the Kingdom, its Agricultural State, and the means of its future Improvement.

The whole Plan ought to be completed, at farthest, in the course of the year 1800, and every unnecessary delay, in the attainment of so important an object, is a real national loss; for the circulation of that Report, the substance of such extensive inquiries, must not only promote increased cultivation, the employment of more capital in that essential source of prosperity, the culture of the soil, and a general spirit of improvement, but must enlighten every farmer in the kingdom, and enable him, either to raise more produce than he does at present, on the same extent of ground, or the same produce at less expence. When to this is joined a judicious system of regulations, for the encouragement of Agriculture, the whole must occasion such an influx of public prosperity, as this country has hitherto never witnessed.

All this cannot be effected, unless the Board has under its consideration, an immense mass of printed materials, from which to make the necessary selections, and to extract the substance. This requires considerable expence, infinite labour, and perhaps may occa-

to the idea of those, who doubt the propriety of carrying on these inquiries with energy, they consider not the loss which the public sustains, by retarding, for a single year, nay, for a single month, the advancement of National Improvement. Indeed nothing can enable us to bear up, under the pressure of so many heavy debts and taxes, but a general system of improvement, excited by the inquiries, and carried on upon principles, confirmed by the authentic information, collected by the Board of Agriculture.

sion the printing of several papers, which may not seem, in every instance, essential. But the architect, who has a magnificent edifice to construct, collects numerous heaps of materials, of every description, which the inexperienced bystander considers perfectly useless, and wonders what is to be done with them; yet these, when properly made use of, may be formed into one great building, distinguished for its beauty, its symmetry, and its strength.

APPENDIX. M.

General View of the Inquiries essential for the Internal Improvement of the Kingdom, with the Plan for reprinting the Agricultural Surveys, in a corrected form. By the President of the Board of Agriculture.

A BOARD established for the purpose of making every essential inquiry into the Agricultural State, and the means of promoting the internal improvement of a powerful empire, will necessarily have it in view, to examine the sources of public prosperity, in regard to various important particulars. Perhaps the following is the most natural order for carrying on such important investigations; namely, to ascertain,

1. The riches to be obtained from the surface of the national territory.
2. The mineral or subterraneous treasures of which the country is possessed*.
3. The

* The following Letter on the subject of a Mineralogical Survey, written by the celebrated Kirwan, that respectable philosopher, is recommended to the reader's attention.

SIR,

When last I had the honour of meeting you in London, you were pleased to express a wish, that, in order to promote a mineralogical survey of the kingdom, the proper objects of inquiry in every country should be briefly pointed out, and in such a manner, as that they may easily be discerned even by such persons as cannot be supposed to be deeply versed in such matters; in compliance with your wishes I now send you the principal heads of such inquiries, many of which may be satisfactorily answered by architects, common land surveyors, masons, and even labourers; though it were to be wished

3. The wealth to be derived from its streams, rivers, canals, inland navigations, coasts, and fisheries: And

4. The means of promoting the improvement of the people in regard to their health, industry, and morals, founded on a *statistical* survey, or minute and careful inquiry into the actual state

that persons of still superior education, as those of the clerical and medical professions, were also consulted. In the mining countries in particular, as Cornwall, Derbyshire, Flintshire, Devonshire, Lancashire, &c., the overseers of the works could give the best information: in many, several private gentlemen are known to be well instructed in those matters.

1st. Are there any mountains in that country? and their names: what is their course or direction? their height, known or reputed? whether of steep or gentle ascent, cultivated, woody, or otherwise? dry or abounding in springs? in continued ridges, or separate and distinct? what sort of stone are they formed of, (whether at the top, middle, or bottom? what is their inclination?) or is found in them, as granite, sandstone, whin, limestone, marble, alabaster, Derbyshire spar, freestone, flags, slates, gravel, flint, &c. are they solid or cavernous? are they single, or one within the other? and the different stones in each. What other hills or *eminences* are there? of what composed? stony or chalky, and their direction and bearings with respect to the mountains?

2dly. What rivers traverse the county? their names, length, breadth, depth, and direction; what lesser streams flow into them, and their direction? temporary or perennial, apt to overflow or otherwise? what lakes, and their extent?

3dly. What, or do any mineral springs occur in any or what parishes, and what is their nature if known? by whom examined, and when?

4thly. What sort of stone commonly occurs in different parishes? in the plains, in sandpits, making of roads, for building, millstones, &c. and what quarries?

5thly. What are the different soils that occur in different parishes, as clays, marls, sands, loams, are these last clayey, or sandy, or gravelly, or chalky? what mosses? do they yield peat? have brick clay, fire-clay, potters' clay, terras, fullers' earth, tripali, &c. been found?

6thly. What

state of every parochial district in the kingdom, and the circumstances of its inhabitants.

Under one or other of these heads, every point of real importance, that can tend to promote the general happiness of a great nation seems to be included.

Investigations of so extensive and so complicated a nature, must require, it is evident, a considerable space of time before

6thly. What mines are found in the country? whether metallic, or saline, or coaly? whether in veins, or beds, or bellies? their inclination and direction or bearing? how is the ore raised? where are the ores worked, and the general mode of smelting them? were any, or what *improvements* lately made in the manner of draining them, freeing them from water, or working, or smelting them? are there any still required? have all the hills and mountains been yet examined, with regard to their mineral contents?

7thly. Have any collection or cabinet of the fossils of each county as yet been formed? let samples of each, docketed with the name of the place in which it was found, be sent.

Much information, relative to these inquiries, may be found in the Philosophical Transactions, histories of particular shires and counties, as Cornwall, Derbyshire, &c.; tours through England, Wales, and Scotland, the works of Woodward. A committee may perhaps be named, to examine these, and arrange the particulars found in each shire, which might perhaps help the persons, to whom queries are to be addressed, to recollect and find them.

These are the particulars which at present occur to me; they may be digested, enlarged, and perhaps better methodized in a Committee. When answers are had, which at farthest may be in a year or two, a mineralogical map of the kingdom may be formed, serving as a fund of information, and a ground of future improvements in Agriculture, commerce, and all the arts.

I have the honour to be,

Your very obedient and humble Servant,

R. KIRWAN.

Dublin, November 17th, 1795.

To Sir John Sinclair, Bart. &c. &c.

they can be completed. Differing indeed in many respects from each other, it is better perhaps that they should be undertaken at different periods, and separately considered. Under that impression, the Board of Agriculture has hitherto directed its attention to the first point only, namely the cultivation of the surface, and the resources to be derived from it.

That the facts, essential for such an investigation, might be collected with more celerity and advantage, a number of intelligent and respectable individuals were appointed, to furnish the Board with accounts of the state of husbandry, and the means of improving the different districts of the kingdom. The returns they sent were printed, and circulated by every means the Board of Agriculture could devise, in the districts to which they respectively related; and in consequence of that circulation, a great mass of additional valuable information has been obtained. For the purpose of communicating that information to the public in general, the Board has resolved to publish the survey of each county, as soon as it is brought to a state fit for publication. When all these surveys shall have been thus reprinted, it will be attended with little difficulty to draw up an abstract of the whole (which will not probably exceed two or three volumes quarto) to be laid before his Majesty and both Houses of Parliament; and afterwards, a General Report on the present state of the country, and the means of its improvement, may be systematically arranged, according to the various subjects connected with Agriculture. Thus every individual in the kingdom may have,

1. An account of the husbandry of his own particular county; or,
2. A general view of the agricultural state of the kingdom at large, according to the counties, or districts into which it is divided; or,
3. An arranged system of information on agricultural subjects, whether accumulated by the Board since its establishment, or previously known;

And

And thus information respecting the state of the kingdom, and agricultural knowledge in general, will be attainable with every possible advantage.

In reprinting these Reports, it was judged necessary, that they should be drawn up according to one uniform model; and after fully considering the subject, the following form was pitched upon, as one that would include in it all the particulars which it was necessary to notice in an Agricultural Survey. As the other Reports will be reprinted in the same manner, the reader will thus be enabled to find out, at once, where any point is treated of, to which he may wish to direct his attention.

PLAN OF THE REPRINTED REPORTS.

Preliminary Observations.	CHAP.	
CHAP.		2—Farm houses and offices; and repairs.
I. Geographical State and Circumstances.		3—Cottages.
SECT. I—Situation and extent.	IV. Mode of Occupation.	
2—Divisions.	SECT. I—Size of farms—character of the farmers.	
3—Climate.	2—Rent—in money—in kind—in personal services.	
4—Soil and surface.	3—Tithes.	
5—Minerals.	4—Poor rates.	
6—Water.	5—Leases.	
II. State of Property.	6—Expence and profit.	
SECT. I—Estates and their management.	V. Implements.	
2—Tenures.	VI. Inclosing—Fences—Gates.	
III. Buildings.		
SECT. I—Houses of proprietors.		

CHAP. *

VII. Arable Land.

- SECT. I—Tillage.
- 2—Fallowing.
- 3—Rotation of crops.
- 4—Crops commonly cultivated; their seed, culture, produce, &c. *
- 5—Crops not commonly cultivated.

VIII. Grasses.

- SECT. I—Natural meadows and pastures.
- 2—Artificial grasses.
- 3—Hay harvest.
- 4—Feeding.

IX. Gardens and Orchards.

CHAP.

X. Woods and Plantations.

XI. Wastes.

XII. Improvements.

- SECT. I—Draining.
- 2—Paring and burning.
- 3—Manuring.
- 4—Weeding.
- 5—Watering.
- 6—Embanking.

XIII. Live Stock.

- SECT. I—Cattle.
- 2—Sheep.
- 3—Horses, and their use in husbandry, compared to oxen.
- 4—Hogs.

* Where the quantity is considerable, the information respecting the crops commonly cultivated, may be arranged under the following heads :

- | | |
|--|--|
| 1. Preparation { tillage,
manure. } | 6. Culture whilst { hoe,
growing { weeding,
feeding. } |
| 2. Sort. | 7. Harvest. |
| 3. Steeping. | 8. Threshing. |
| 4. Seed (quantity sown) | 9. Produce. |
| 5. Time of sowing. | 10. Manufacture of bread. |

In general the same heads will suit the following grains : Barley. Oats. Beans. Rye. Peas. Buckwheat.

Vetches - Application.

Cole-feed { Feeding, }
{ Seed. }

Turnips { Drawn - - - - }
{ Fed - - - - }
{ Kept on grass - - }
{ — in houses - - }

5—Rabbits.

CHAP.

- 5—Rabbits.
- 6—Poultry.
- 7—Pigeons.
- 8—Bees.

XIV. Rural Economy.

- SECT. 1—Labour—servants
—labourers—
hours of labour.
- 2—Provisions.
- 5—Fuel.

XV. Political Economy,
as connected with
or affecting Agri-
culture.

- SECT. 1—Roads.
- 2—Canals.
- 3—Fairs.
- 4—Weekly markets.
- 5—Commerce.
- 6—Manufactures.

CHAP.

- 7—Poor.
- 8—Population.

XVI. Obstacles to Im-
provement;

including general ob-
servations on Agricul-
tural Legislation and
Police.

XVII. Miscellaneous Obser-
vations.

- SECT. 1—Agricultural So-
cieties.
- 2—Weights and mea-
sures.

Conclusion.

Means of improvement,
and the measures calculated
for that purpose.

Appendix.

Perfection in such inquiries is not in the power of any body of men to obtain at once, whatever may be the extent of their views or the vigour of their exertions. If Lewis XIV. eager to have his kingdom known, and possessed of boundless power to effect it, failed so much in the attempt, that of all the provinces in his kingdom, only one was so described as to secure the approbation of posterity *; it will not be thought strange that

* See Voltaire's Age of Lewis XIV. vol. ii. p. 127, 128, edit. 1752.

The following Extract from that Work will explain the circumstance above alluded to.

“ Lewis had no Colbert, nor Louvois, when about the year 1698, for the instruction of the Duke of Burgundy, he ordered each of the

that a Board, possessed of means so extremely limited, should find it difficult to reach even that degree of perfection which, perhaps, might have been attainable with more extensive powers. The candid reader cannot expect in these Reports more than a certain portion of useful information, so arranged as to render them a basis for further and more detailed inquiries *. The attention of the intelligent cultivators of the kingdom,

the intendants to draw up a particular description of his province. By this means an exact account of the kingdom might have been obtained, and a just enumeration of the inhabitants. It was an useful work, though all the intendants had not the capacity and attention of Monsieur de Lamoignon de Baille. Had what the King directed been as well executed in regard to every province, as it was by this magistrate in the account of Languedoc, the collection would have been one of the most valuable monuments of the age. Some of them are well done; but the plan was irregular and imperfect, because all the intendants were not restrained to one and the same. It were to be wished that each of them had given, in columns, the number of inhabitants in each election; the nobles, the citizens, the labourers, the artificers, the mechanics, the cattle of every kind; the good, the indifferent, and the bad lands; all the clergy, regular and secular, their revenues, those of the towns, and those of the communities.

“ All these heads, in most of their accounts are confused and imperfect; and it is frequently necessary to search with great care and pains to find what is wanted. The design was excellent, and would have been of the greatest use, had it been executed with judgment and uniformity.”

* The County Reports, as originally drawn up, were circulated merely as a foundation for procuring additional information; and indeed, when corrected, they ought to be considered only as chapters of a great work, and not as distinct publications. Even in their original state, however, they are extremely valuable; and Dr. James Anderson, who, in consequence of his being employed by the Board, had an opportunity of perusing them, thus states his opinion of the mass of information which they contain. “ The Board of Agriculture,” he observes, “ is an institution, which if its inquiries shall be prosecuted for a sufficient length of time, with due caution and energy,

will

dom, however, will doubtless be excited, and the minds of men in general gradually brought to consider favourably of an undertaking which will enable all to contribute to the national stores of

will be productive of national benefits, greater than perhaps have been derived from any other political institution in modern times. For although the money which has been expended on this department, when compared with that bestowed on any other national establishment, may be considered as nothing, yet, in consequence of its exertions, continued for the course of little more than one year, a body of authentic facts, respecting the agricultural and internal economy of this country, have already been laid before the public, greater than was ever obtained in any other nation since the beginning of time; on which facts the political inquirer can ground his reasonings, on many of the most important topics that can ever engage his attention, with a degree of certainty he could never have otherwise obtained. In consequence of this, many ideal phantoms of proposed national aggrandizement will be banished, and, in their stead, plans of substantial improvement will be brought forward, which could not otherwise have been adopted; because the obstructions, which repress alike the suggestions of genius, and the hand of industry, would have remained unknown, as they hitherto have been, in every European nation, and of course entirely unattended to by those classes of men, who alone have power to remove them.

“As a striking illustration of the truth of these assertions, (he goes on to remark) that the essay he submits to public consideration, (on the obstacles to the advancement of Agriculture in England,) will consist of little more than a compressed view of the facts that have been brought to light by the Agricultural Surveys *already printed*, some of which were facts unknown, or never adverted to, by every person who should read his publication: for I presume, (he observes) that no one person in any situation in Britain, could have otherwise had an opportunity of observing the whole; and innumerable persons no doubt exist, who are deeply interested in the discussion, who never before had adverted to one of them: and who, of course, could never be aware of the very important consequences that flow from them.”

The Doctor then proceeds to state the principal obstructions to Agriculture, which occurred to him in the course of a careful perusal of

of knowledge, upon topics so truly interesting as those which concern the agricultural interests of their country; interests, which on just principles never can be improved, until the present state of the kingdom is fully known, and the means of its future improvement ascertained with minuteness and accuracy.

The necessary inquiries into the richness of the surface, will soon be completed; and if the other inquiries above hinted at are gone into with equal energy and spirit, this kingdom may reach a degree of political strength; and its inhabitants will enjoy a height of public and of individual happiness, which it is believed has never hitherto been attained in any other country.

of those Reports, in which the reader will find much useful information*. If such a paper could be drawn up, with the assistance of the original sketches of those Reports alone, what light may not be expected when they are reprinted in a corrected form, with all the additional materials which have been collected, in the course of their circulation.

* See Essays relative to Agriculture and Rural Affairs, vol. iii. p. 4.

APPENDIX. N.

Plan of an Agreement, among the Powers of Europe, and the United States of America, for the Purpose of rewarding Discoveries of general Benefit to Society. By the President of the Board of Agriculture.

THE plan of establishing a Board of Agriculture, for promoting the internal improvement of Great Britain, though long a favourite idea of the person who brought forward that proposal, yet could never have been carried to its present state of perfection, had it not been for an extensive tour which the Author made, through some of the most interesting parts of Europe. In the course of that tour, he saw several valuable institutions for public purposes, from each of which, as well as from those at home, he took such hints as seemed to him likely to be of service, and formed on the whole the plan of an establishment, on a scale sufficiently extensive, to merit, he flattered himself, the approbation of a British Senate: and Parliament was at last prevailed upon to adopt it, not however without some opposition, and merely as an experiment. The result, he flatters himself, must be in the highest degree satisfactory to those who wished well to such an undertaking. The Board was constituted only on the 4th September, 1793, and already a greater mass of Agricultural and Statistical knowledge has been collected, in little more than a year and a half, than ever was accumulated before in so short a period.

The improvement of his native country, was not the sole object which the Author, however anxious to promote it, had in view, when he formed this establishment. He knew well that it would soon prove of general benefit to society. The carrying on, therefore, a correspondence with foreign states,

disposed to enter into such an intercourse, was a part of the original plan. A Secretary, acquainted with several of the most important languages in Europe, was attached to the Board, for the purpose of conducting that correspondence; and though the war, so generally raging on the Continent, has given a different direction to the minds of men, and greatly impeded such an intercourse, yet much useful information has been received from, and communicated to, foreign countries, since the Board was established.

There are some points connected with the improvement of a country, which are only applicable to particular places; an improvement, for instance, in the culture of the vine would be of no use to the northern parts of Europe; nor would it be of any consequence in the southern, that the Scotch fir could be made doubly valuable, by using the branches of young fir, as an article of food for sheep or cattle, in the winter season, when it is so difficult to support them. There are many objects, however, of equal importance to all countries, and in the improvement of which every nation is equally interested; for example, any discoveries in consequence of which a greater quantity of animal or vegetable food can be produced for the use of man,—any improvement in medicine,—in the means of saving fuel,—in the construction of houses for the lower orders of the people, &c. and many other particulars of a similar nature.

Discoveries made in one country gradually reach another; but the interval is often tedious, and the loss thereby sustained is great: whereas, if the progress could be more accelerated, the consequences might be in the highest degree beneficial, not only to the country that receives, but to the one that makes the discovery. For no individual, or even nation, can carry any art or new invention to its ultimate state of perfection. It must be improved upon for that purpose by the investigation and experience of others.

Deeply impressed with the justness and importance of these ideas, I take the liberty of submitting to the consideration of those intrusted with the government of this, and of other states, the propriety of a general Agreement among the Powers of Europe,
and

and the United States of America, for the purpose of rewarding those who make any useful discovery, interesting to the species at large, in Rural Economy, in Medicine, or in the Useful Arts, and that every means be taken to have the same rapidly extended, and brought to its ultimate state of perfection.

Such an agreement would be attended with but little expence to the different powers who entered into it, whilst the credit, the satisfaction, and the benefit which each Government would ultimately derive from such an understanding would be of infinite value.

If each power should agree to pay a sum, call it from 50*l.* to 500*l.* or 1000*l.* according to the amount of its revenue, and to the advantage it would be likely to obtain from any new invention of the nature above alluded to, it would be of little consequence to each, whilst the total would be of considerable value to the fortunate discoverer.

The attention of mankind being directed to such useful objects, it is impossible to say to what perfection the arts necessary for their comfort and sustenance might be carried.

The desire for fame and emolument, and the emulation of many nations, rivalling each other in such arts, would soon produce discoveries, the importance of which can hardly be estimated at present.

And such an understanding, though it would not probably put a stop to war, yet might have the effect of rendering war less frequent, and less ferocious.

I was led to bring forward such reflexions, sooner than otherwise I had intended, in consequence of having lately succeeded in obtaining from Parliament, the grant of 1000*l.* to Mr. Joseph Elkington, so celebrated for his skill in draining, and knowledge of springs.

The art which he has acquired in such perfection, would be as useful to other countries, as it is to Great Britain; and no reason can be assigned, why it should not be immediately extended all over Europe and America.

Here there can be no rivalry; for the Agricultural prosperity of one country can do no injury to another; and indeed it may be of considerable service, in times of scarcity
for

for instance, from which the most fertile cannot always be exempted.

Let us suppose, therefore, that such Powers as chose to enter into the agreement above suggested, in addition to the 1000 *l.* already voted by the British Parliament, were to begin the proposed agreement, by subscribing each a sum of money to Mr. Elkington, on his disclosing his discoveries in so clear a manner, that other nations might avail themselves of the same valuable art.

Can any discovery be of more general utility? In a moist country, it is well known, that nothing is so much to be wished for as to get rid of water. In a country that is dry and parched, what can be more desirable than to obtain the command of springs?—In both these respects, there is every reason to believe, that Mr. Elkington has reached a very high, and hitherto unequalled, pitch of excellence.

If examples of the benefit to be derived from such an agreement, in regard to other matters, independent of Agriculture, is wanting, it may be sufficient to remark, that an American physician is said to have found out a valuable remedy for the cancer, and a German, a very effectual palliative, if not a cure, for the stone and gravel. As these are acknowledged to be perhaps the most dreadful disorders to which the human frame is subject, surely such discoveries are objects of general concern, and if brought to perfection, ought to be rewarded by every civilized power in the universe.

The only objection to such a measure, is, the risk of imposition on those Powers, who live remote from the place where such discoveries may be made. But surely those who trust their respective Ministers with the management of great political concerns, may safely confide to them the disposal of any sum that may be necessary for such a purpose. Besides, it would be desirable to have a Board of Agriculture and Internal Improvement established in every country, for the purpose of carrying on a correspondence and intercourse between the different States of Europe and America, on subjects of general moment, and to the examination of such a body, any discovery of a doubtful nature might be referred.

If the measures above hinted at were adopted, a new scene in politics might be the happy consequence, and the rulers of nations might in future boast,—not of their numerous fleets,—not of their gallant armies,—not of extended commerce,—of splendid or luxurious arts, or acquisitions by intrigue or conquest,—**BUT OF THIS,**—*That within their respective dominions, a greater number of human beings, enjoyed all the blessings of political society, in greater perfection, than hitherto, they had ever been enabled to attain, in any former period of history.*

LONDON,
1st July, 1795.

CONCLUSION.

THE preceding papers will sufficiently explain the various measures which have been recommended to the attention of the Board of Agriculture, for the purpose of promoting the internal improvement and prosperity of the country. It may not be improper, however, here to recapitulate them, in order that the reader may have, under his eye at once, a general view of the whole system.

1. The first object, is the one which the Board has already sanctioned, namely, that of inquiring into the riches to be obtained from the surface of the national territory. With that view, it is proposed to lay before the public, as expeditiously as possible, corrected Reports of the Husbandry of each particular county, and the means of its improvement; and some steps also are taking towards preparing an arranged system of information, on agricultural subjects. The farmer will thus be furnished with all the knowledge he could possibly wish for, regarding either his own particular district, or the art of husbandry in general, and the landlord will have easy

access to any information he can require for managing or improving his property, in a manner infinitely more to his own benefit, and to the public advantage, than it is possible for him, at present, to imagine.

2. The mineral or subterraneous treasures of which a country is possessed, is the next great object of inquiry, and a most important one it is, for in many cases the richness of the surface, in point of real value, is nothing compared to what may be found under it. A complete and regular survey of our subterraneous wealth, would be the means of furnishing greater sources of opulence to this country, than the acquisition of the mines of Mexico and Peru. In fact, Great Britain at present owes no inconsiderable portion, even of its agricultural and commercial wealth, to its fossil and mineral treasures; and the great additions which would necessarily arise in consequence of the proposed survey, would be felt throughout every productive artery of our national prosperity.

3. Another separate head of inquiry, and source of incredible wealth, is the riches to be derived from the streams, rivers, canals *, and inland navigations, coasts, and

* I think it necessary here to give the reader some faint idea of the astonishing advantages to be derived merely from applying the *waste water* of canals to the purposes of irrigation. The following is a Circular Letter written at the desire of the Board upon that subject, and the observations thereon by a very intelligent engineer.

I. *Circular Letter to the Canal Companies.*

“GENTLEMEN, *Board of Agriculture, July, 1796.*

“I am requested by the Board of Agriculture, to submit to your consideration a subject of considerable national importance, that of applying navigable canals to the purpose of irrigation, or of watering land. We have every reason to believe that the canals already formed,

or

and fisheries of the kingdom. That many additional millions, *per annum*, might be obtained by a proper attention to those unbounded sources of national riches,
can

of now forming, might be made applicable to this very material use, without any injury to their common destination; for though it might not be proper in many cases to spare water in summer, yet in winter and spring, when most abundant and least essential to navigation, its utility, if thrown on the adjacent lands, would be indisputable; and by this means a considerable revenue might accrue to the owners of canals, by granting certain quantities of water weekly, or monthly, to the proprietors of the adjacent ground, and infinitely to the advantage of the public. Should this idea meet with your approbation, the Board would apply for a general act of Parliament to permit the proprietors of canals to make this use of their waste water, and for any other general regulations respecting canals, which may be thought necessary, and which you may have the goodness to suggest. The act might pass so early, that it might be in your power, in the course of the ensuing winter, to try experiments on the practicability of the measure. Engineers, skilled both in navigation and in irrigation, would soon ascertain what quantity of water could be spared from each canal, at the different seasons of the year, and the extent of land over which it might be conveyed. It may not be improper to inform you, that this use of navigable canals has long been common, and carried to a considerable extent in the Milanese, where the rents paid for water thus taken, have in some cases equalled the expence of forming the navigation; that this plan has rendered that part of Italy among the most fertile and opulent in Europe, and contributed more to the improvement of the country than any other idea that has been adopted. It is from water-meadows thus obtained, that the celebrated Parmesan cheese, is, in many instances, produced.

“ The anxiety felt by the Board of Agriculture for extending the benefits resulting from your useful undertakings to new objects, which might prove equally beneficial to yourselves and to the public, has occasioned this trouble on the part of, Gentlemen, &c.

“ P. S. I think it proper to add, that there are some useful works, in the German, Dutch, and Swedish languages, on canals, embankments, and the like, which it would be worth while for the Canal
C c 2 Companies

can hardly be questioned. By extending inland navigation, by improving the harbours on our coasts, and by carrying our fisheries to the height of which they are capable,

Companies in England to join in having translated. If each Company would subscribe for from 10 to 50 copies, such translations might be obtained and printed."

II. *Extract of a Letter from an intelligent Engineer, on the above Subject.*

"I have received your Circular Letter respecting the plan of watering of land by the means of navigable canals; on which there ought only to be one opinion as to its being a point of the greatest importance, which could have come under the consideration or patronage of the Board of Agriculture; and if any obstacles should occur, they must arise from prejudices which time will wear off; for that such a rational application of the waste water of canals, will at one period or another take place, seems not to admit of a doubt.

"In Europe, the improvements in the Milanese are a striking instance of the fertility which may be created by such an application of the waste water of canals; and if any thing else was wanting to add to this conviction, the economy of the waters of the Nile may be produced as another instance, and perhaps even a more striking one than the Milanese; as in this last case, an unrivalled fertility was spread over the sandy wastes of Egypt and the Thebais, and even over the scorching plains of Lybia.

"The lake Mœris, formed as a reservoir in the bosom of barren mountains, is a feature which cannot be mistaken; and it ought to prove an useful lesson for the management of rivers in general, most of which, in some place or other, may be treated in the same way: the excess of floods may be drawn off, and in dry seasons water may be issued for the use of the navigation of the same rivers, for the working of mills, for the purposes of watering land, and for supplying navigable canals.

"The very lakes which now exist in Great Britain, may, in general, and at a very moderate expence, be raised a few feet above, or drawn off a few feet below, their usual level, and this, upon extensive surfaces, would supply a quantity of water, which would produce much fertility to the countries which lie below that level.

"A general

capable, it is impossible to say, what additional treasures might not be accumulated. That, however, must entirely depend, on our making the necessary inquiries,

“ A general survey of the kingdom, directed so as to ascertain the comparative levels of its surface, would be a very necessary step towards the general management of water ; and this survey should be made with great accuracy, and noting the leading objects, and peculiar advantages and disadvantages in each district, with their relative situations as to the connecting districts ; and from these separate Reports and Surveys, a general arrangement of the whole might take place, and many useful plans be pointed out.

“ In general, I should suspect that in this business, there are evils to be guarded against, and which are likely to arise from two very opposite classes of people. In the one class may perhaps be ranged, those land-owners and mill-owners, whose minds are not so sufficiently enlightened as, to be sensible of the general utility of the scheme, or the benefits which must eventually arise to themselves ; and they, of course, will be averse to submitting to any alterations which may interfere with the water.

“ And the other class will consist of projectors and projecting engineers, who may be in any shape engaged in the arranging or executing this plan, and who, being wholly engrossed with new schemes, may be led to despise real obstacles, and to give a favourable complexion to impracticable projects.

“ As the first, it is hoped, will not form a majority of the community, an act of parliament will remove all legal obstructions as far as it respects them ; and a perseverance in repeating calm demonstrations, and the sensible operation of the scheme itself, must in the end, convince them that so far from this plan proving an injury or injustice, that not only the country at large demands it, but that they will be benefited individually ; indeed there is no reason but their own obstinacy, why they should not be benefited immediately, and that in a double capacity ; because, as canal stock is transferable, and fluctuating, these land-owners, and mill-owners may become proprietors of the canal navigations, and so receive a share of the advantages arising from this distribution of water, and they may likewise, in this way, have a voice in the direction of its operations.

inquiries, and following up a regular system of improvement.

4. But riches alone are not sufficient to make either an individual or a nation happy, and for carrying national felicity to the extent of which it is capable, it is necessary to inquire into the circumstances of the people, and the means of promoting their improvement, in regard to their health, their industry, and their morals.

“ And besides this, canal stock seems more than any other property, to connect the apparent interests of the greatest number of individuals, with the improvement of the land and manufactures of the countries through which the canals pass, since it is in proportion to this prosperity that the canal proprietors can receive their pecuniary advantages from an increased tonnage : thus a number of persons residing in distant quarters of the kingdom, who probably could never have become land-owners, are in this way intimately connected with the improvement of the land, &c. This is a circumstance that I take the liberty of mentioning more at length, because I do not recollect that it has hitherto been taken notice of ; and it appears to me of considerable importance. I have for instance observed, that in a certain inland canal navigation, where there are upwards of 1200 proprietors, most of them people in tolerable circumstances, and in trade, and residing in 12 counties ; that all of them are looking with anxiety to the increasing produce and consumption of Cheshire, Derbyshire, Montgomeryshire, and Shropshire, although, if it had not been for this circumstance, very few of them would have known or have concerned themselves about that part of the country.

“ With regard to the being led astray by projectors or projecting engineers, this may be in a great measure prevented by the choice in the appointment of the engineers who are to take the surveys, and the committee under which they shall act, and the care to be taken in the comparing and arranging the several Reports and Surveys, and many of the Members of the Board of Agriculture will, from their own local knowledge, be enabled to check any false representation.”

Hence

Hence arises the benefit to be derived, from those statistical inquiries, now nearly brought to a conclusion, so far as regards Scotland, and which, I trust, will soon be extended over the southern part of the kingdom. The advantages resulting from such investigations, need not here be dwelt upon, having already been sufficiently explained.

Lastly, though, when these inquiries are completed, the government will become possessed of all the information this country can furnish, for establishing the happiness of its inhabitants, yet to perfect the whole, it would be desirable, to unite all the civilized nations of Europe, and of America, in rewarding those who make discoveries of real benefit to society. No single country can expect to bring all the useful arts to perfection. Some improvements, it may always expect to receive, from other states; and if ingenious men have reason to believe, that any important discovery they make, would be rewarded by other nations, as well as their own, it is difficult to say, to what perfection and extent the useful arts might speedily be carried. It was the emulation excited among the various states of Greece, that raised the liberal arts so rapidly to a height, in the age of Pericles, which it can hardly be contended, they have ever since reached, in any succeeding æra.

I have thus sketched out a system, which, were it carried into effect, would surpass any thing hitherto suggested, not only for making this country happy and powerful, but also for accumulating that information, on the knowledge of which the general happiness of the species must depend. It is impossible for a private and unconnected individual, to do more than to point out the plan, and to declare his readiness to devote his

time, and unceasing exertions, to assist in the execution of it. Should it now be arrested in its progress, he has the consolation of thinking, that it will be no fault of his. At any rate, he has taken every measure in his power to explain the nature and principles of the system, and to make it as generally known as possible, in the hopes that either under the auspices of the present most valuable Institution, or of some other that may arise, in some future æra, or perhaps in some other hemisphere, the plan he has sketched out, that extensive and laborious, but at the same time most important of all sublimary undertakings, may be happily accomplished.

ESSAY X.

PROPOSALS

FOR ESTABLISHING BY SUBSCRIPTION

A NEW INSTITUTION,

TO BE CALLED

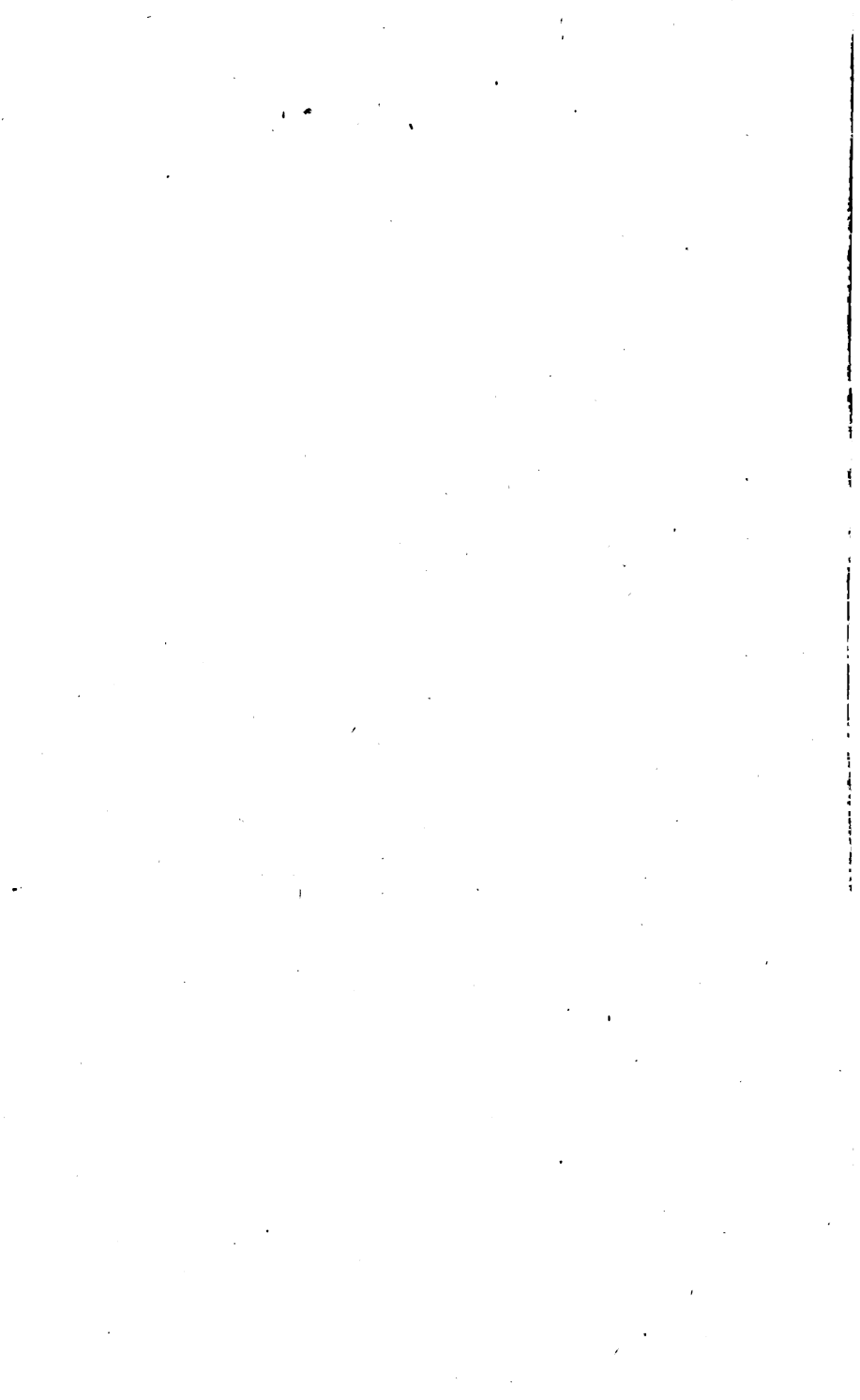
THE PLOUGH;

OR

**JOINT STOCK FARMING AND EXPERIMENTAL
SOCIETY,**

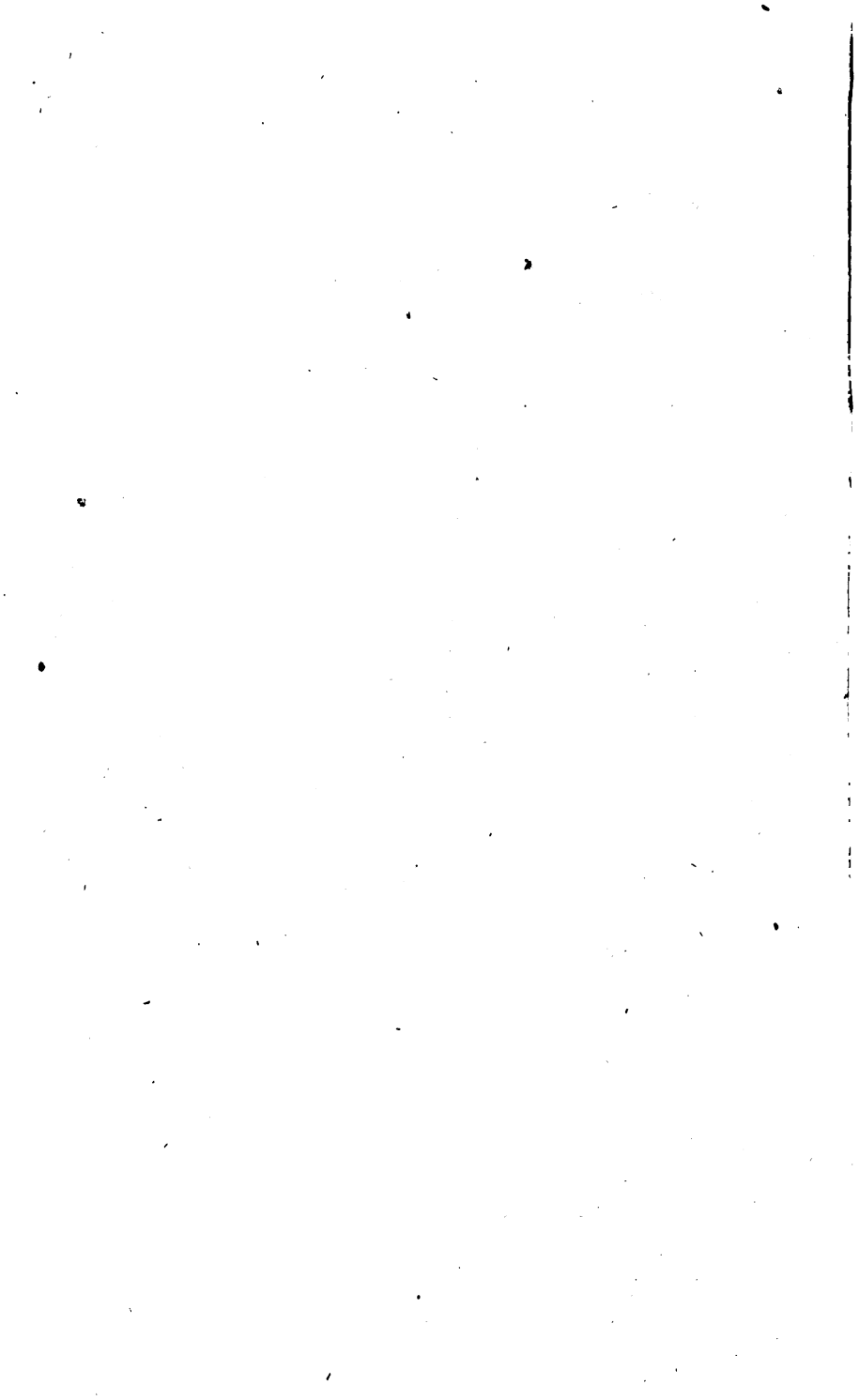
FOR

**ASCERTAINING THE PRINCIPLES OF AGRICULTURAL
IMPROVEMENT.**



ADVERTISEMENT.

THE frequent scarcities of Grain which have lately occurred, the heavy additional expences they have necessarily occasioned to all ranks of society, and the peculiar distresses which the lower orders have thence experienced, render it indispensably necessary, to bring forward such measures, as have a tendency to promote the cultivation and improvement of the country. I was thence induced, to submit the following Proposals to the consideration of the Public. It will hardly be credited in future times, that after having raised a subscription to the amount of above 30,000*l.* which would soon have reached 80,000*l.*, or any other sum that might be judged necessary, that a charter of incorporation should be refused. This was the more unfortunate, as it would have completed the measures essential for promoting the agricultural improvements of these kingdoms, the Board of Agriculture being established with a view of collecting the principles of the art, in so far as they are already known, and the Joint Stock Farming or Experimental Society being intended for perfecting that art by new and additional experiments. In case such a plan should afterwards be revived, with a better prospect of success, it was thought adviseable, to preserve the papers regarding it, in this Collection.



ESSAY X.

PROPOSALS FOR ESTABLISHING, BY SUBSCRIPTION, A NEW INSTITUTION, TO BE CALLED THE PLOUGH;

OR

Joint Stock Farming and Experimental Society, for ascertaining the Principles of Agricultural Improvement.

IN explaining the nature and advantages of the proposed Institution, the following Plan will be adopted.

To state, 1. The advantages of experimental farms in general. 2. The nature of the proposed institution, and the manner in which it was intended that the plan should be carried into execution. 3. Answers to such objections as have been urged against such a measure; and, 4. Some observations on the advantages which might be derived by the public in general, and by the landed interest in particular, from the establishment of a Corporation, with a large capital, devoted to agricultural improvement.

I. *Advantages of Experimental Farms.*

It is much to be doubted, whether the art of agriculture can ever be brought to any high degree of perfection, unless by means of experiments, accurately tried, and persevered in for some time. We have hitherto, in general; relied too much on vague opinions, and assertions which have not been warranted by sufficient authority; whereas nothing but accurate and repeated experiments

periments can thoroughly improve the agricultural art, and ascertain the principles on which it ought to be conducted. For these and other reasons, unnecessary here to dwell on, Mr. Arthur Young, Mr. Marshall, in a recent, and in former publications, Dr. Francis Home, and other distinguished agriculturists, have repeatedly urged the advantages of having farms established for that special purpose. The importance of such farms to the different districts in which they were respectively placed, has been put beyond all question by the authors above alluded to; and I trust it will appear, in the course of the following observations, that no measure can be suggested, more likely to be attended with advantageous consequences to the inhabitants of the metropolis, or of any considerable and flourishing town, than that of having an experimental farm, on a great scale, in its immediate neighbourhood.

I. From the increasing population of London, and of the other large towns in the kingdom, it is impossible that they can be supplied with provisions at a reasonable rate, unless the agriculture of the country in their neighbourhood is brought to a high degree of perfection, which can only be done through the medium of experimental farms, the only sure means of ascertaining the principles of improvement. At present, the nation is under the necessity of depending on foreign industry and cultivation for a part of its subsistence; and we are periodically visited with a scarcity of food, which increases the expence of living to every family in the kingdom, and loads the rich with heavy additional burthens to maintain the poor, and to preserve them from the miseries of famine. A small portion of that sum, the exaction of which thus becomes so frequently necessary, were it properly applied to the improvement of agriculture, would

would soon enable this country to feed itself, and, indeed, would put it in the power of the farmer to supply the public with provisions at a reasonable rate. Hence it is evident, that every man who pays 1 *5d.* instead of 9*d.* for a loaf of bread, or 1 *os.* *per* pound instead of 2*s.* for poor-rates, ought to consider himself essentially interested in promoting agricultural improvements; and ought, for his own interest, to support any measure calculated for that purpose, as far as his circumstances will admit of it.

II. It is well known, that there is scarcely any part of the kingdom, where greater quantities of waste and unproductive land are to be found than in the neighbourhood of London, or ground, in many instances, more capable of improvement. It is to be hoped that the General Bill of Inclosure will soon pass, in consequence of which those wastes will be divided. But that will be of little avail, unless the means of improving them are ascertained. When Enfield Chase was divided, many persons expected to make considerable profit, by purchasing and improving portions of that waste; but from ignorance how to go about it, the greater part of these undertakers suffered by the attempt. Whereas, had the principles of improvement been accurately ascertained, by means of experimental farms, no error of any great magnitude could have been committed, and the purchasers of Enfield Chase would have improved the land they had purchased, greatly to their own and to the public benefit.

III. There are numbers of persons in the city of London, and in other large and flourishing towns, who accumulate considerable fortunes by Commerce, by the Law, by the practice of Medicine, and other lucrative professions, whose ultimate object is to retire into the country, and to reside on an estate purchased by the profits

profits of their own industry and exertions. But after having purchased an estate, how can they manage it to advantage, or carry on the improvement of their property, without having previously acquired the knowledge necessary for that purpose? Many have attempted it, but have severely suffered by it. Whereas were there an experimental farm in their immediate neighbourhood, which, as subscribers, they had it in their power occasionally to visit, the books of which would always be open for their inspection, they would be enabled to acquire, in fact without expence, (for their subscriptions to the experimental farms will ultimately be repaid with compound interest,) much knowledge and experience in the best modes of managing landed property, and of carrying on every species of improvement, of which they may avail themselves with peculiar advantage, when they are enabled, from the profits of successful industry, to purchase estates in the country.

Lastly. Many of the inhabitants of London are led, for the sake of recreation or health, occasionally to spend some time in the country: at present, many of them leave town without having any particular object when they make such excursions. But if accommodation were provided for those who wished to visit the experimental farm, and plots of ground allotted in its neighbourhood, where cottages or villas might be erected by the subscribers, what an advantage would it not be to the promoters of the proposed institution? In that case, when they went to the country, they would have an opportunity of directing their attention to the most important of all inquiries, and of collecting information on a subject, in which, in various respects, they must feel themselves deeply interested. Such an advantage ought certainly to be restricted to those who are subscribers

scribers to the proposed institution, and must appear to every intelligent person, a circumstance of the highest importance to any individual residing in the metropolis, in the adjoining villages, or in any considerable town in the kingdom.

II. *On the Nature of the proposed Institution, and the Manner in which it was intended that the Plan should have been carried into Execution.*

I. THE PROPOSED CAPITAL.

1,600 shares at 50*l.* each - - - £.80,000

It is also intended to admit half shares at 25*l.* each; but the persons holding them, though they will have a right to partake in the pecuniary advantages of the proposed institution, are not to be entitled to vote in the choice of the Directors. The number of shares which each person may hold, not to be restricted. The Directors to be annually chosen in London, and to meet there. The books of the Society to be always open to the inspection of the subscribers.

II. PROPOSED EXPENDITURE.

1. To the expence of establishing of eight experimental arable and grazing farms, in the neighbourhood of London, and in different parts of the kingdom, at 4,000*l.* each, on an average - - - - - £.32,000

2. To ditto for two upland farms, for improving mountain sheep, at 1,500*l.* each 3,000

Carried over - £.35,000
D d Brought

	Brought over	-	£.35,000
3.	To the expence of purchasing 5,000 acres of land, incloſing and planting them with larch, fir, and other trees, and various expences attending the ſame	- -	35,000
4.	To a Contingent Fund, reſerved for incidental and unforeſeen expences	-	10,000
	Total	-	<u>£.80,000</u>

III. ULTIMATE RETURN, *and other* ADVANTAGES.

1.	Sale of ſtock, crop, and implements, on the experimental farms, at the concluſion of 21 or of 30 years, or any other period that may be fixed on by the Society	- -	£.35,000
2.	Value of 5,000 acres of land, the build-ings erected thereon, and of 1,250,000 larches, fir, and other trees, at the concluſion of 30 years	- - - -	218,000
3.	Principal of the Contingent Fund, on the ſuppoſition that the intereſt will defray all expences of management, &c.	- -	<u>10,000</u>
	Total	-	£.263,000

Which is above thrice the original capital. According to the calculations of ſome experienced nurſerymen, the return will be ſtill greater, and will exceed the produce of the capital laid out at compound intereſt, at 5 *per cent*. Without pretending to aſcertain what muſt depend upon the value of timber, and a variety of other circumſtances at the moment, it may be ſufficient to remark, that the propoſed inſtitution, muſt not only be productive of infinite public benefit, but muſt ultimately be a concern ſufficiently profitable, to entitle it to the cordial

cordial support of those who are friends to public improvement.

In addition to the ultimate return, the subscribers will, in the interim, enjoy the following advantages, namely,

1. The advantage of having an account of the proceedings of the Society annually transmitted to them ;
2. The privilege of visiting the experimental farms, either in their own neighbourhood, or wherever they are established by the Society ;
3. The right of nominating persons to be instructed at the different Agricultural Academies proposed to be erected at each experimental farm ; and,
4. A division of the annual profit that may arise from the experimental farms.

It is also intended to keep up such a connection with the Board of Agriculture, and the various Societies formed for Agricultural purposes in the Kingdom, as cannot fail to be attended with the most important advantages both to the Society itself, and to the farming interest in general.

Though a capital of 80,000*l.* or upwards, would be necessary to carry the proposed measure into complete effect, yet from 15,000*l.* to 20,000*l.* will be sufficient to give the plan a fair beginning, either with an Experimental Farm, or an extensive Plantation, or with both, in the neighbourhood of the metropolis. It was never intended to let the measure drop, if the whole capital could not be raised at once ; for however desirable it might be, to carry a great scheme into execution, because it commands the attention of those who take a concern in its management, and must necessarily produce more public good, yet the important object certainly is, first to obtain a charter, and next

to lay a solid foundation, which may afterwards be extended as circumstances will admit of it.

As soon as a proper farm can be established near the metropolis, accompanied with an extensive plantation, the profit of which must at least secure indemnification to the Subscribers, there will then be a model held forth, which every county in the kingdom may adopt that approves of such an idea; and it is, without doubt, much to be wished for, that several Experimental Farms and Plantations were established in various parts of the country, as branches of the same Institution; not only for the purpose of comparing the result of the same experiments, carried on by different people, and in a diversity of soils and climates (by which a spirit of emulation would be excited among the managers appointed to conduct them), but also as it would have the happy effect of directing, with greater force, the attention of the public to an Institution, which, instead of being confined to any particular district, extended its beneficial influence from one end of the island to the other. Unless, however, the money necessary for that purpose, is in a great measure advanced by the proprietors and farmers, where such Farms and Plantations ought to be situated, and the management of them inspected by committees of gentlemen residing in their immediate neighbourhood, who would undertake that trouble, and who were interested as Subscribers in the success of the undertaking; it would be in vain for any Institution formed in London, to endeavour to carry such a plan into execution, upon the extensive scale suggested in the original proposals.

As in various parts of the kingdom, however, particularly in the western and midland districts, in the counties

counties of Hants *, Durham and Northumberland, in Wales, and in Scotland, the establishment of Experimental Farms has long been a favourite object; there can be no doubt, that by exertion and perseverance, the measure of having a number of Experimental Farms, conducted under the auspices of the same Institution, will ultimately be accomplished.

III. *Answers to such Objections as have been urged against the proposed Institution.*

FIRST OBJECTION. *That no Experimental Farm at all is necessary.*

It is supposed by some, that no Experimental Farm is necessary, and that the principles of agricultural improvement will be brought to a sufficient degree of perfection without such an establishment. That grain may be raised, and cattle bred, without the aid of Experimental Farms, may be safely acknowledged, in the same manner as, in early ages of society, manufactures were carried on for domestic purposes, without the aid of much machinery; but no sooner had the population and commerce of a country increased than it became necessary to improve the art of manufacturing even the most common articles, by means of new inventions, and it is equally necessary to improve the art of agriculture, so as to produce more grain, and to feed more cattle on the same extent of ground, otherwise it will be impossible to furnish food to the increasing population of a country. Without Experimental Farms this cannot be effected.—Without such establishments it is impossible to ascertain what practices ought to be avoided, and what ought to be pursued. The former

* In Hampshire they have actually established an experimental society, in consequence of these suggestions.

is as important to be known as the latter, yet they are seldom communicated to the public, because the farmer is in general ashamed of acknowledging his want of success, and indeed, where his experiments answer, they are frequently concealed, lest others should avail themselves of such discoveries. The object of an Experimental Farm, however, is to ascertain facts, and to publish them, and as much credit would be acquired by an intelligent and public-spirited society for their exertions in detecting errors, as in proving facts likely to be useful.

SECOND OBJECTION. *That there are many Experimental Farms, now carried on by individuals, which will answer the same purpose.*

It is said, in the second place, that there are many distinguished characters, who carry on experiments for their own amusement and information, by whose means every important fact will, in process of time, be ascertained. No man is more disposed to do justice to the merits of the respectable personages above alluded to than I am, nor can be more convinced, that their example is of infinite advantage to those who have the means of examining the progress they make. Their farms, however, are more properly to be accounted *pattern farms*, for the advantage of their own immediate neighbourhood, than experimental ones, in the strict sense of that word. In order indeed to render Experimental Farms generally useful, the farms must be open to the inspection of the public; the account of each experiment must be regularly published, and every experiment likely to effect the cultivation of any part of the kingdom, must be tried with the utmost precision. It cannot be expected, that persons of high rank, and whose attention is necessarily directed to other objects, can renounce every other pursuit, and devote themselves exclusively

to the conducting of experiments. Whereas, when an Experimental Farm is once established, it will soon be proved by the evidence of facts; 1. What is the best mode of rendering arable land productive, and the proper rotation of crops to be adopted in all soils and situations: 2. What is the best system for the management of grass land: 3. What are the most useful implements of husbandry: 4. What are the most profitable breeds of animals, and the best and cheapest mode of rearing, of feeding, and of fattening them: 5. What is the best plan for rendering waste or barren land productive. These are points of infinite consequence, which never have yet, and indeed never can be ascertained, unless by means of farms appropriated for that special purpose. It will require, it is true, the unceasing attention of an intelligent manager, and the experiments, in order to be relied on, must be made with almost mathematical accuracy and strictness. The expence also must be considerable, but the ultimate advantage to the public must be so great, as amply to compensate for any trouble or cost which may attend the execution*.

THIRD OBJECTION. *That it would be difficult to find Managers.*

It is an obstacle to this measure, in the apprehension of some, that it will be scarcely possible to find managers

* For instance, if the question is,—what is the best breed of cattle? their food must be accurately weighed, and a regular account preserved of the whole quantity they eat during the course of the experiment. If the question is to ascertain whether large or small animals pay best for the food they eat, the experiment must be begun from their birth, and continued till they are slaughtered. In short, almost every experiment of great consequence requires a degree of attention and perseverance, and a duration in point of time, which can only be expected from a public institution devoted exclusively to that purpose.

qualified for the purpose. It certainly will be attended with some difficulty, but it would be libelling the agricultural skill and integrity of the country to suppose that such men could not be found. I know some myself, who would carry on the undertaking with zeal and energy, who would take some shares in the proposed undertaking, as a security for their good behaviour, and a pledge of their being interested in its success, and who, in every other respect, would, I am persuaded, be found perfectly adequate to the task. And here, I beg to remark, that it is hardly possible to suppose any person placed in a more desirable situation than the manager of such an Experimental Farm, if he felt a zeal in the cause, nor more likely to be detected, if he was either negligent of the duties he had to perform, or was guilty of dishonesty. He would lie under the necessity of making regular weekly reports of all his transactions: the books of the farm would be constantly liable to inspection; and the farm itself open to the examination of the subscribers; and perhaps, at stated times, of the public. A man placed in a situation so peculiarly ostensible, must be both honest and diligent. If he succeeds in his management, he has the credit of accomplishing one of the most important objects that any individual could undertake, and if he is detected in acts of negligence or dishonesty, his guilt could not be concealed,—it must necessarily become public, and he is ruined for ever. With such inducements to act well, and such serious grounds of apprehension if he should act otherwise, it is scarcely possible to suppose, that any human being, of common understanding, could be deficient in his duty.

In regard to the particular plan of experiments to be pursued, the following measures may be adopted. As
soon

soon as a farm is taken, an accurate plan of it should be obtained, distinguishing the different soils, and every other circumstance connected with it. Every assistance will then be procured from the most skilful practical farmers in the kingdom, to draw up a regular course of experiments, and a rotation of crops best calculated for the different fields; and such a plan must be rigidly adhered to by the manager, unless the committee of management give directions to the contrary. Thus the manager will only be accountable for the strict execution of the orders he receives, and as those orders will be given, in consequence of the most mature consideration, hence the whole system, it is to be hoped, will be carried on with the utmost regularity and correctness. There would not then be a single principle in agriculture, that might not thus be ascertained in the space of a few years, and farmers in future, would have an invariable standard to go by, which they might rely on with certainty.

FOURTH OBJECTION. *That the profits of the proposed plantations are over-rated.*

It is evidently impossible to foresee, what will be the value of timber 30 years hence, as that must entirely depend on the quantity brought to market, on the demand, and on the state of credit and the quantity of money in circulation at the moment. As the price of every article, however, is progressively rising, is there not reason to imagine, that it will also be the case with timber? But even if that should not be the case, should timber sell only at its present value, the following circumstance will sufficiently prove, that the calculation of profit given in the original proposals, is *greatly under-rated*. The circumstance alluded to is this: in the neighbourhood of Edinburgh, there is a considerable

wood amounting to above 300 acres, called the forest of Culrofs. It consists of Scotch firs, 43 years old. An exact survey has been taken of it, and an estimate of its value drawn up. It is stated in the advertisement, that there are 3500 cubical feet of measurable timber, the upset price of which is 6*d.* per foot; and 6000 running feet of pit-timber, at a farthing per foot. The value of both, per acre, would then be as follows:

I. 3500 cubic feet at 6 <i>d.</i> per foot	£.87 10 0
II. 6000 running feet at $\frac{1}{4}$ <i>d.</i> per foot	6 5 0

Total per acre	- £.93 15 0

It is well known, that the value of larch at 30 years growth, is equal to that of fir at 45 years. There is reason therefore to hope, that the 5000 acres of land, proposed to be planted with larch, would be worth 90*l.* per acre, which, for 5000 acres, would amount to 450,000*l.* instead of 218,000*l.* at which the sale of the timber, the ground, &c. was originally estimated. What the timber in Culrofs forest will really sell for, is not yet known, but there is every reason to believe, that the price must be higher than 6*d.* per foot, and that the calculation of profit from the proposed plantations, originally stated at 218,000*l.* will be found greatly underrated.

On the whole I hope it will appear, that though there is no plan of so extensive and complicated a nature, to which ingenious men may not discover objections, yet that none can be urged against the present proposal which may not be satisfactorily answered; and that even if some difficulties should remain, they ought not to stand in the way of carrying a measure into effect, of such infinite public importance, which would lay the
foundation

foundation of rendering this country superior to every other for agricultural skill, and consequently the most likely to reach the summit of power and opulence.

IV. *On the Advantages which might be derived by the Public in general, and by the Landed Interest in particular, from the Establishment of a CORPORATION, with a large Capital, devoted to AGRICULTURAL IMPROVEMENT.*

“THE FARMING SOCIETY,” as now proposed to be incorporated, is for the object merely of ascertaining the principles of agricultural improvement, and forming plantations to indemnify the expences it may occasion; but it may, in process of time, be converted into a great corporation, uniting the landed and monied interest together, and combining their mutual efforts for promoting the improvement of the country. A solid foundation being once laid, it is impossible to say to what a height the edifice may ultimately be carried.

Let us consider for a moment what may be effected upon the basis we are now establishing.

It is well known that the great obstacle to the improvement of land is the want of capital. Landed gentlemen have very rarely much money to spare; when they are only tenants for life, they are seldom much disposed to expend the money they have on the improvement of their property: and if they have no money to spare, the situation of being tenants for life disqualifies them from borrowing. Indeed, if money could be borrowed by landed gentlemen, they are naturally apprehensive, whenever it becomes scarce, and consequently difficult to be obtained, that they might
be

be called upon for repayment. All these circumstances are fatal obstacles to improvement.

But let us suppose, that **THE FARMING SOCIETY** increases its capital to one or two millions, or any other sum that may be judged necessary, and that its capital consists in shares of transferable stock; in that case every obstacle to the improvement of land, *in so far as regards capital*, might be removed. For, in the first place, money is to be had; in the second place, no repayment of the sum borrowed is necessary, for the regular payment of the interest is all that the Society can require, as any individual belonging to it can bring his share of transferable stock to market, and obtain its value: and thus tenants for life, under proper legislative restrictions, may be enabled to obtain money for the improvement of their estates.

This plan may, in various respects, be attended with public benefit.

I. The monied interest will thus be accustomed to direct their attention and capital to the improvement of land, by which every acre in the kingdom may progressively be brought into a state of agricultural cultivation or of useful produce.

II. By erecting such a corporation, not only great capitals, but even small ones, may be employed for the valuable purpose of promoting domestic improvement. At present, small sums, as 50*l.* and the like, are of little use for that purpose; but if a corporation were erected, with shares amounting to 50*l.* every man who had that sum to spare, by subscribing to the capital of that corporation, might promote the agricultural improvement of the country.

III. When the interest of the money falls, as it probably will do when the war is over, there are many persons

persons in this country, who may be tempted, either to send their capital out of it, or to emigrate entirely, from the difficulty of placing their funds to proper advantage. They cannot all get into manufactures and commerce; they cannot purchase land; they cannot lay out small sums on landed security, and the price of the stocks will be high. But if this new means of investing their capital were opened, the extent of which is so great, they would have no temptation, either to send their capital abroad, or to abandon their native country, as they might lay out their capital at home, with perfect security, and to great advantage.

IV. At the conclusion of a war, numbers of individuals, disbanded from the fleets and armies, find it extremely difficult to procure the necessary means of subsistence. This naturally has a tendency to reduce the price of labour, and is greatly in favour of improvement, where a capital can be found adequate to the purpose. But, for the want of the establishment of such a corporation as the one above suggested, the conclusion of former wars has hitherto been distinguished by much distress among individuals, and the commission of many crimes, which would not have been the case, if the landed interest had had the means of procuring money on principles similar to the public, namely, those by which the payment of the interest only is necessary, and where the immediate repayment of the capital is not required.

In order still farther to explain the nature of the advantages, it may be proper to observe, that a great corporation, such as the one now suggested, may contribute to the agricultural improvement of the country in various ways.

In the first place it may lend money to individuals, for the purpose of improving their property, at a certain interest *per annum*, stipulating for the repayment of the principal whenever it may think proper, which is certainly the most exceptionable principle, on which a landed gentleman can borrow money, as the repayment of it may be required when it cannot be had almost on any terms.

2. It may lay out its capital on the security of the estate, stipulating for repayment, not only of the interest agreed upon, but also of a part of the capital, by periodical instalments, which would have the effect of a sinking fund.

3. The company itself might undertake to carry on various improvements; in particular might promote a system of irrigation to more advantage than even private individuals, because it would be worth their while to secure the services of the most skilful persons in that art, who would, of course, accomplish it cheaper, than others with little practice could do. And indeed, by experience, they might bring the art of watering to still greater perfection than it has hitherto reached. It is hardly necessary to add, that irrigation is the greatest and most substantial of all improvements, for by means of watering, land may be raised from two shillings to forty shillings, and even to five pounds per acre. Its advantage to the public is infinite, producing a crop from ground which never requires any other manure than water, and which crop produces the means of fertility, by which other fields may be enriched. The value of the increased manure, which is thus produced, can hardly be estimated.

The same principles are applicable to other means of increasing the value of land, particularly inclosing, embanking,

embanking, and in some cases manuring with lime and marle, where a great expence is necessary from the quantity required, but where the improvement is substantial and permanent.

4. There is certainly no mode by which such a company could lay out a part of its capital with greater certainty of profit, than by carrying on plantations on a great scale, as the ground might be inclosed and planted, and the plantations themselves preserved, till they were out of danger, by contract. But with a view of securing timber for the navy, it is the best plan that could be devised. It is well known that the crown has not been able to raise timber enough to supply our dock-yards. The resource of private individuals cannot be relied on with certainty, it is so much for their interest to cut down early. But if a company were erected, one of whose most important objects was, supplying the navy with timber, tracts of land might be planted amply sufficient for the purpose; a regular system, in conjunction with Government, might be formed, and any apprehensions that may be entertained of any scarcity of so essential an article for our natural bulwark, might be done away.

5. I see no objection to such a society undertaking also to bring land into a state of culture, and of yielding agricultural productions. Suppose they were to take 500 or 1000 acres of Hounslow Heath, or Finchley Common, or any or the tract of the same sort, paying to the parish a certain annual rent for a lease of 50 years. The parish might apply that rent to diminish the poor-rates, or in any other manner most likely to promote the general benefit. The society might by contract have the whole tract inclosed; might put it into a state of culture, and might then let it off during the

the

the remainder of their lease to advantage. In this way the interest of the society, of the parish, and of the public might be promoted, and a means pointed out of bringing extensive tracts of waste land into a productive state.

I know that some respectable individuals entertain considerable apprehensions regarding the profits to be derived from such corporations, from the negligence and the charges of management attending the manner in which their business is usually conducted. To the public this is not so material, because, if there is a considerable additional produce, it is immaterial whether A as a proprietor, or B as a servant, reaps the benefit of it; and it is certain that the business of any corporation cannot be carried on, without a good deal of expence. But the fact is, that the greater the scale on which a corporation is established, the less the expence will be in proportion to its capital; and that where there is a great capital properly applied, there can be no doubt that the return will not only defray any expences that may be incurred in carrying on the business, but will also yield an ample profit to the proprietors.

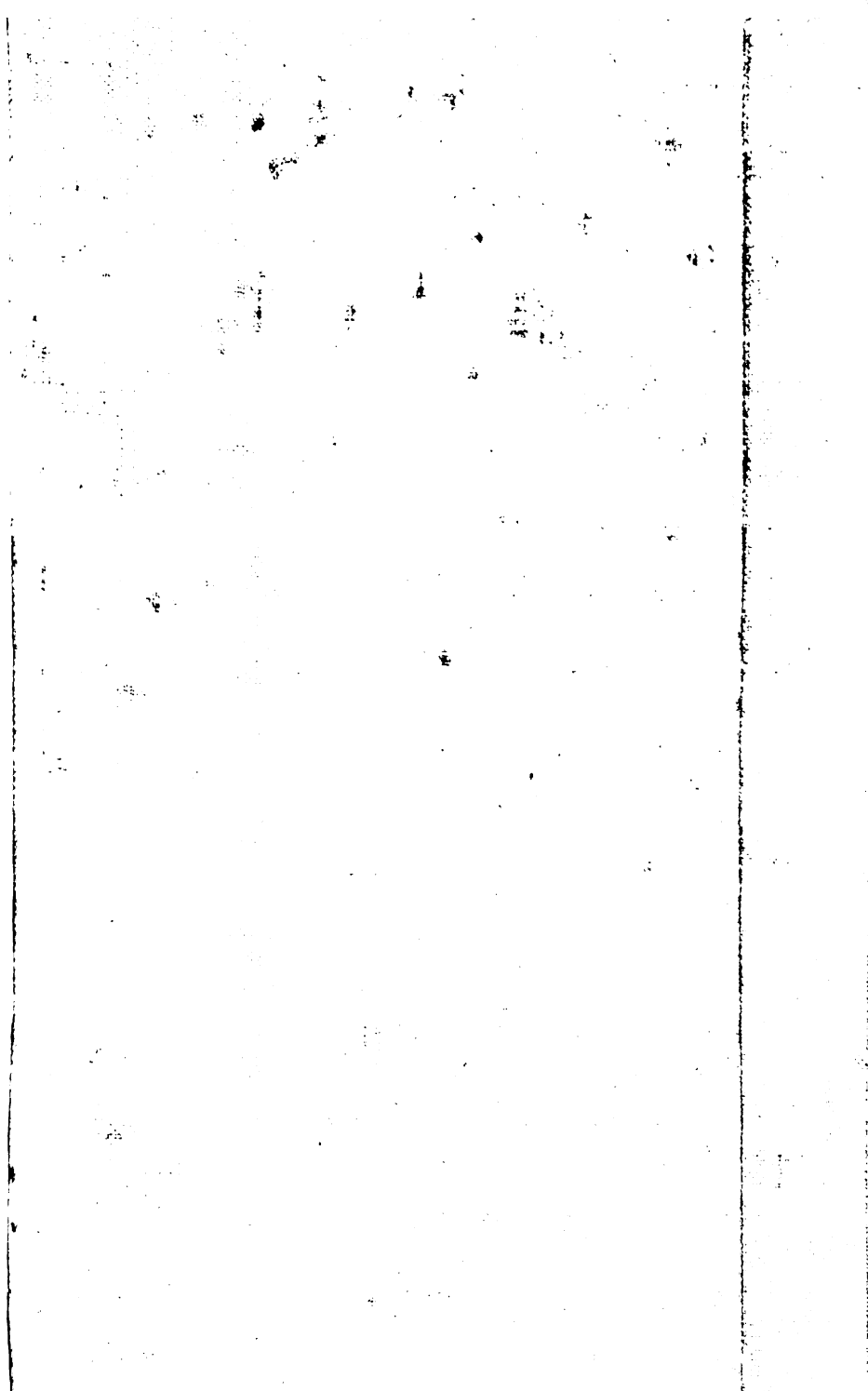
On the whole, there is every reason to hope, that after some experience is got, by means of the Farming Society now proposed, a great Corporation may ultimately be erected, on such principles as these, by which not only the interest of the public may in various respects be materially promoted, but also that the private advantage of those individuals, who may take a concern in such an undertaking, may be essentially promoted.



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10 A. Lucerne.	4 A. Rape for Seed.
10 A. Old Pasture.	4 A. Summer Tares.
LIVERPOOL LIBRARY 10 A. D ^o 1. GRA	4 A. Winter Tares.
10 A. D ^o	4 A. Tams. 2 A. Pars- nips.
10 A. Saintfoin.	with the smaller ivation. —
10 A. Wheat drilled.	uts with ground.
10 A. Wheat Broodcast	2. G. TICLES
10 A. Wheat dibbled.	ts on the Soils.
10 A. andhoed anted &c.	s with res.
5 A. Experiments with Barley. & Big allow.	ts with allow.

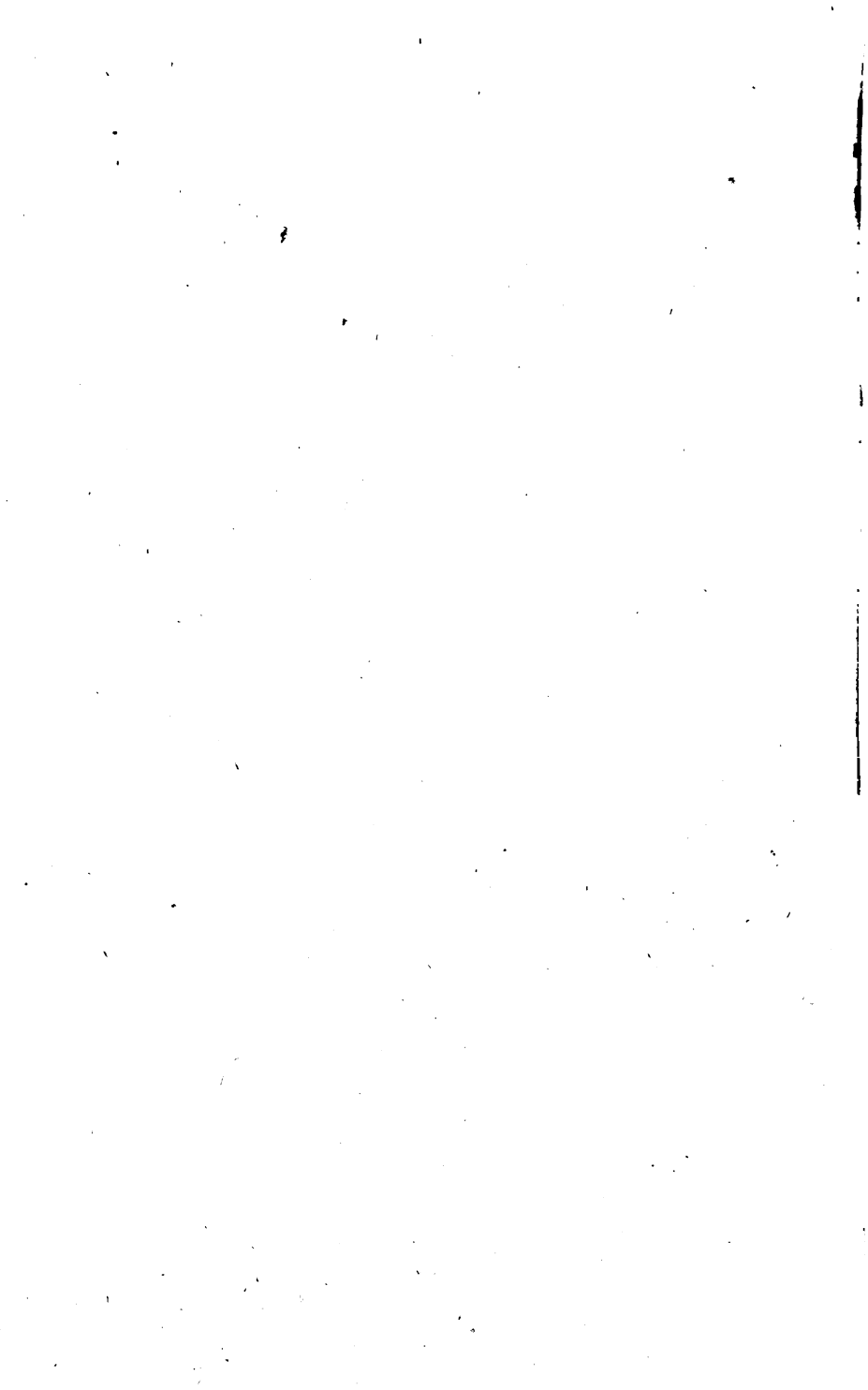


DESCRIPTION

OF THE

ANNEXED PLATE.

The Plate is intended to give an idea of an Experimental Farm, arranged into four departments, and states the various particulars which may be cultivated in each. It is not to be expected, that a farm can be procured, exactly calculated for carrying through such a plan completely, but the nearer it can approach to it the better. It is hardly necessary to add, that the Plate can only represent the arrangement for one year, and that the crops of every succeeding year must vary, according to the rotations that are to be adopted, and the diversity of the seasons.



ESSAY XI.

LETTER

TO THE

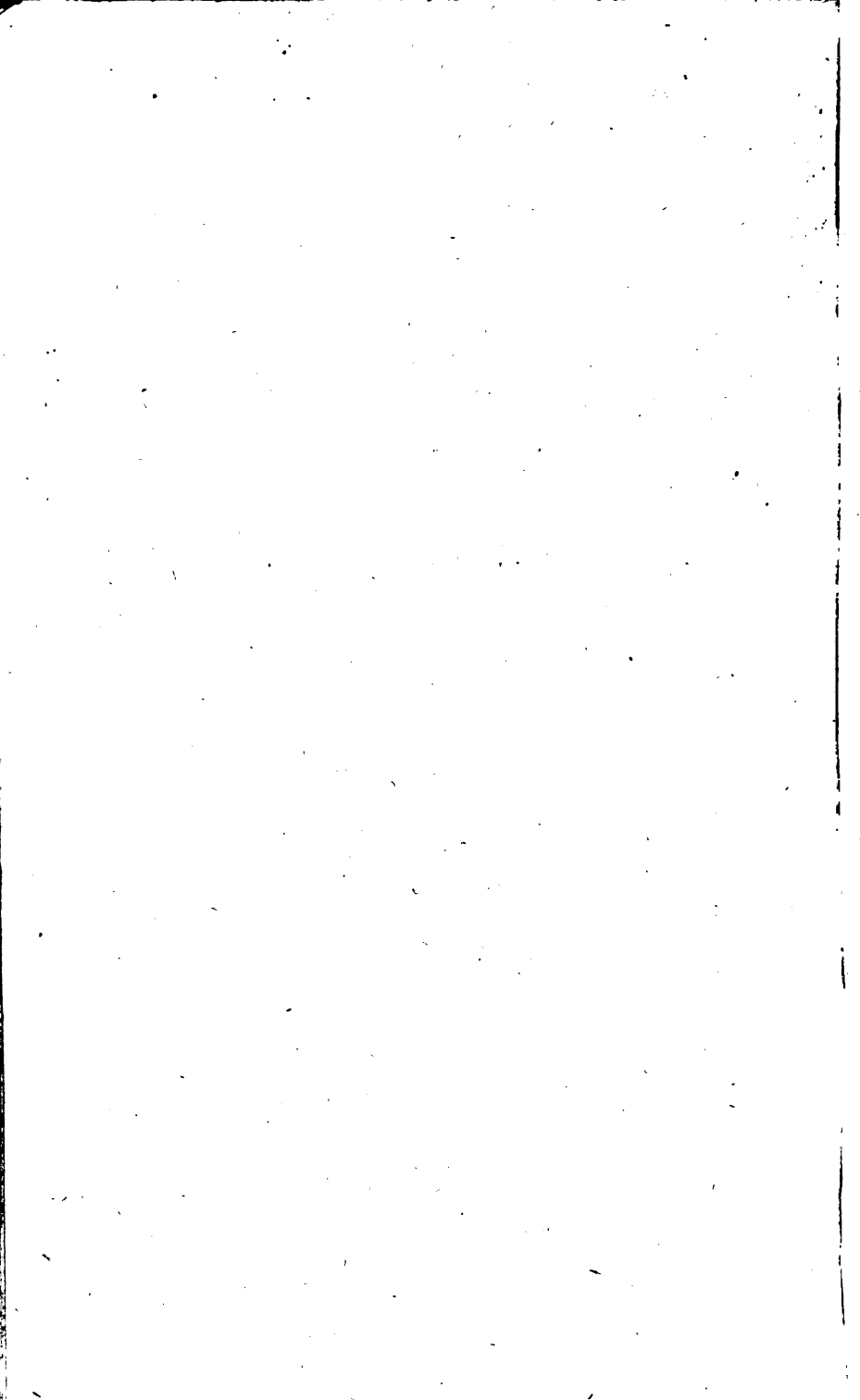
PROPRIETOR

OF

AN EXTENSIVE PROPERTY,

ON THE

**MEANS OF PROMOTING THE COMFORT, AND IMPROVING THE
SITUATION, OF THE PEOPLE IN HIS NEIGHBOURHOOD.**



ESSAY XI.

LETTER TO THE PROPRIETOR OF AN EXTENSIVE PROPERTY,

ON THE

Means of promoting the Comfort, and improving the Situation, of the People in his Neighbourhood.

SIR,

YOU wish to know, what are the best means of improving the situation of the people in your neighbourhood, and your partiality to me induces you to imagine, that it may be in my power to furnish you with some useful suggestions. I sit down without hesitation to obey your commands, as, next to the pleasure of doing good, and performing beneficent actions in person, there cannot be a greater gratification, than to assist others in the generous attempt. I am extremely apprehensive at the same time, that it will not be in my power to communicate any information, which has not already occurred to yourself, or which you might not receive from other quarters with much more advantage.

In drawing up the following observations, I shall confine myself to *general hints*. Were I to enter into minute details, this letter would extend to a most immeasurable length. If, however, the outline pleases

you, there can be little doubt, of your being able to complete the sketch, however imperfect, by your own zeal, abilities, and perseverance.

In any attempt to improve the situation of a numerous body of people, the following particulars require to be attended to. 1. Food; 2. Clothing; 3. Habitation; 4. Fuel; 5. Industry; 6. Health; 7. Amusements; 8. Manners and Customs; 9. Mental Information; and 10. Moral or Religious Instructions.

1. It is indispensibly necessary to secure a sufficient supply of wholesome Provisions, as the basis of every comfort of life. For that purpose it is essential to direct the attention of the people, to the best means of procuring articles of food, according to the situation in which they may happen to be placed, whether by the cultivation of the earth, by pasturage, by fisheries, or by a due proportion of each, where circumstances will admit of it. There is no country in Europe (with the exception of very extraordinary seasons) where abundance of food may not be raised for the existing number of inhabitants, unless where obstacles are thrown in the way of cultivation by injudicious laws; and if one district is deficient, it must be supplied from others, sending in exchange such commodities, as are the most saleable in other markets. I trust, however, that you will find no difficulty, in raising on your own estate, even more than is necessary for maintaining all its inhabitants; and if the land now in cultivation, is not sufficient for that purpose, it ought to be increased.

2. Substantial Clothing tends much to promote the health and comfort of the people, particularly in cold climates; and here the information and assistance of an intelligent proprietor, may be of great use to a whole neighbourhood. In most situations, the lower orders may

be

be taught how to manufacture, and how to make up, a large proportion of the clothes they use. The women may spin both woollen and linen yarn, at times that would otherwise be lost, which is so much additional wealth from labour gained by the community. It may be proper under this head to observe, that the use of flannel shirts cannot be too strongly recommended, as a great preservative against many disorders to which labouring people are subject.

3. Next to food and clothing, there is nothing more essential for the comfort of man, particularly in a northern climate, than Shelter from the inclemency of the seasons. Every means therefore should be taken, to procure comfortable habitations for the people. On that subject much important information has been collected by the Board of Agriculture, but it has not yet been condensed into a regular system. There is no doubt, that the habitations of opulent persons will always be made sufficiently comfortable, and in regard to inferior habitations, there is every reason to believe, that if proper encouragement were given by the Government of the country, 1st, to ascertain the best and cheapest mode of building houses for the lower orders, and 2dly, if premiums were granted to those by whom such plans were carried into execution, every individual in this country, with hardly any exception, would soon be comfortably lodged.

On the subject of cottages, the following particulars are recommended by an intelligent architect, (the late Mr. Wood of Bath,) as essentially necessary to be attended to in such erections. 1. They should be dry and healthy; 2. Warm, chearful, and comfortable; 3. Convenient; 4. Of a proper width; 5. Built in pairs, that the inhabitants may assist each other in case

of sickness or any other accident; 6. Built of the best materials, which in the end will be found the truest economy; 7. In the neighbourhood of a spring or stream of water, or where a well can be procured; and, Lastly, with a piece of ground or garden*. Were it possible to enable industrious cottagers to keep cows, in addition to such accommodations as are above described, their situation would be materially amended.

4. The importance of Fuel, particularly in a cold country, cannot be questioned. It is of use, 1. For cooking victuals; 2. For warmth; 3. To remove damp, which I consider to be of more importance than even giving heat, for cold can be obviated by warm clothing, whereas fuel alone can prevent houses in moist countries from becoming damp and unwholesome; and, 4. For light, there being many a humble cottage, where, after sun-set, the light they have is principally from the fuel they burn. On this particular head it is proper to observe, that it is of the utmost importance, not only to endeavour to procure fuel at a reasonable rate, but to economise it as much as possible.

5. It is necessary that every individual, in all well constituted political societies, should have it in his power to obtain the means of subsistence, either from the property with which he is invested, or by the exercise of some useful occupation. A wise Government will, on the one hand, promote useful occupations, more especially those connected with agriculture, manufactures, and commerce, and on the other hand will discourage such as are pernicious, by wise and judicious regulations. For the purpose of ascertaining whether

* For the details of Mr. Wood's plan, see Communications to the Board of Agriculture, Vol. I. p. 115.

the occupations of the people are injurious or otherwise, it is necessary, not only for the public, but for persons of extensive property, to make, what may be called *Statistical Surveys of their Estates*, with a view of ascertaining how the people are employed, and whether any improvement in that important particular can be suggested.

6. There is no object which merits more to be attended to by any beneficent landlord, than preserving the Health of the people under him; and for that purpose, various steps may be taken. The climate of the country may be improved by draining any marshy parts in the district, and inclosing and planting the more exposed. The ravages of the small-pox may be prevented by inoculation, more especially under the new system discovered by Dr. Jenner; and the comfort of the people may be greatly extended, by promoting the establishment of practitioners skilled in the most essential branches of medicine.

7. I have ever considered it to be a duty incumbent upon the leading characters in every district, to pay attention even to the Amusements of the people, and to promote those which are of a harmless and innocent nature, more especially if they have a tendency to instruct the minds, or to promote humane and social dispositions among those who engage in them.

In Greece, where many of the most essential principles of a wise administration of public affairs were so well understood, public games, theatrical and other amusements, were objects thought well entitled to the attention of Government itself; nor can any thing furnish more agreeable sensations, than to see the people of a district amusing themselves with music, dancing,

and innocent gaiety, and indulging themselves in the pure delights of a genuine rural festival.

8. The happiness of every community must depend much on purity of Manners, and the mode in which the people conduct themselves to each other. When addicted to vicious customs, (and unfortunately bad examples are extremely contagious,) they cannot expect much real comfort in the humbler walks of life. In all countries, there are judicious regulations of police, which ought to be strictly enforced as a curb on licentiousness. But nothing is more effectual, than a good example from the higher orders. Where that is found, it rarely fails to improve the manners of any body of people, and to bring them from rudeness, and barbarism itself, to a considerable degree of civilization.

9. To form a regular system for the Mental Instruction of any community, is another object of the most essential importance. In almost all societies, a few selected Classes receive the benefit of a good education, but the improvement of the remainder is too often neglected. This ought not to be the case. The lower orders cannot expect the same advantages with the upper, but still they ought not to be left in darkness and ignorance; nor is it likely, whilst they remain in such a state, that they can possibly be such useful and valuable members of society, as if their minds were more enlightened.

10. But the object principally entitled to the attention of every beneficent mind is, the instruction of the people in their moral and religious Duties. This, above every thing else, must tend to promote their happiness in this world, and in another. In almost all countries, some attention is paid by Government, to this most essential

essential particular, but in many cases, more with a view of making it an engine of state, than that of promoting the real interests of the people. When such a circumstance takes place, it cannot be expected that the establishment even of the best religious system, can be attended with those advantages which otherwise might be looked for. Far different, I am persuaded, will be your views, in the exertions you will make for establishing the principles of true religion on your extensive domains, and from your success in that most important particular, (regarding which I entertain no doubt,) you will derive, I am persuaded, more real satisfaction, than from any other pursuit, in which great labour, great influence, or great ability, could possibly be employed.

CONCLUSION.

Such are the objects which I take the liberty of recommending to your attention, as including the principal particulars on which the comfortable circumstances, and general happiness, of any community must depend. I sincerely hope; that by your exertions, the practicability of such a system will be ascertained. If it succeeded in one instance, it would soon spread itself with rapid strides, and the person by whom it is first carried into full effect, in addition to the approbation of his own conscience, will be justly entitled to the warmest applause and admiration of his fellow-creatures.

I remain, &c.

JOHN SINCLAIR.



ESSAY XII.

ON

LONGEVITY.



ESSAY XII.

ON LONGEVITY.

INTRODUCTION.

THE means of preserving health, and of attaining great age, are subjects which seem to be well entitled to the peculiar attention of every thinking man. In regard to the former, there is no question: the pleasure that arises from the possession of health, and the distress which sickness occasions, are perpetual mementos that health cannot be neglected. But as to the latter, the propriety of aspiring to long life has been doubted; and it is said, that after a person has lived for 50 or 60 years, and has fulfilled his duties as a man, that he had better retire to make way for others, and that the sooner he quits these sublunary scenes the better. Such sentiments, however, ought not to be indulged. If persons lived only for themselves, and for the gratification of their own passions, and to promote their own interests alone, this might be the case. But if we live, as we ought to do, to promote the happiness of others as well as of our own, and if by living long, we can be of more service, from the knowledge which greater experience, and longer observation must necessarily furnish, the result is, that we ought to live as long as we have health and strength to perform good actions to others, and that the power of doing good, ought to be the proper limit by which our wishes for existence ought to be bounded:

nor

nor ought it to be omitted, that there is an evident and necessary connection between good health and longevity, as it is impossible to possess the one, without its contributing to the enjoyment of the other.

In sketching out some observations on this important subject, it is my intention to state, 1. The circumstances which tend to promote longevity. 2. The rules which have been adopted by those who have attained great age. 3. The peculiar description of countries most remarkable for long life; and, 4. To add some tables of longevity and the duration of human life.

I. *Circumstances tending to promote Longevity.*

The circumstances tending to promote longevity may be considered under the following general heads:—

1. Climate. 2. Form of the individual. 3. Parentage. 4. Natural disposition. 5. Situation in life. 6. Professions. 7. Exercise or labour. 8. Connubial connections. 9. Sex; and, 10. Renewal of age.

1. *Climate.* In the first place, climate seems to be of considerable importance; and it may be laid down as a general rule, that the moderate, or even the coldest climates, are the most favourable to long life. Heat seems to relax and enfeeble, cold to strengthen and brace, the human frame. The diet also of hot countries is not so nourishing as that of cold*; and there is in general a greater disposition, and greater opportunities to indulge in various excesses in the former, than in the latter. But if the climate be cool, a rainy atmosphere seems to be less unfavourable to longevity

* In cold countries they live more upon animal, in hot countries upon vegetable, food, and fruits. A judicious mixture of both is the best plan to pursue, but of the two, animal food is the most nourishing.

than could well be imagined; for Ireland, which is a wet country, boasts of a great number of old people. And a very large proportion of the aged who have lived in England and Scotland, have resided in the western, and, consequently, the rainiest counties in the island*.

2. *Form.* The next circumstance to be considered is, the form and size of the individual. It is generally admitted, that persons of a compact shape, and of a moderate stature, are the most likely to live long. Height often originates from the disproportioned growth of some particular part of the body, which necessarily has a tendency to engender weakness and disease. Tall persons also are apt to acquire a habit of stooping, which contracts the chest, and is a great enemy to free respiration; whereas the short-sized find little difficulty in keeping themselves erect, and are naturally much more active, by which the animal functions are retained in a state of much greater perfection. The only disadvantage attending a short stature is, that it is frequently accompanied with corpulence, which is rather unfavourable to long life.

3. *Parentage.* Being born of healthy parents, and exempted from hereditary disease, are circumstances evidently favourable to longevity. A puny frame, like Cornaro's, may, by the greatest care and anxiety, be preserved in existence; but those who inherit health and strength, and are born with robust constitutions, can

* Moisture, it would appear, is not prejudicial to health, if it does not affect the purity of the air. Even stagnated water, if in peat bogs or morasses, is not unwholesome, as the water, by the astringency of the peat, is prevented from becoming putrid. Lincolnshire, also, and several of the marshy counties of England, can produce a number of instances of great age, but probably they were from the more elevated parts of these districts.

alone expect not only to live long, but to enjoy the pleasures and comforts of life, whilst they continue to possess it.

4. *Natural disposition.* Longevity also seems to depend much upon good temper, mixed at the same time with a cheerfulness of disposition, or good spirits*. Neither the irascible, nor those who, from despondency, sink under the crosses of life, can expect to live long. Even those who suffer their strength and spirits to be exhausted by severe study, or other mental exertions, seldom reach great age. In the long list of 1712 persons who lived about a century, Fontenelle, (who did not quite reach 100 years,) is the only author of any note; and his great age is ascribed to the tranquil ease of his temper, and that liveliness of spirits for which he was much distinguished; for he retained to the last *the youth of old age*, as the French happily express it.

5. *Situation in life.* It is commonly observed, “that it is not the rich and great, not those who depend on medicines, who become old, but such as use much exercise, are exposed to the fresh air, and whose food is plain and moderate †.” And it is certain that persons of that description, in general, stand the best chance of living long. At the same time, though instances of old age in great and noble personages are not often to be met with, yet they may be as many, *in proportion to the smaller number of such persons*, as those in the lower but more numerous classes of society. Nor is there any thing inconsistent in power, rank, or wealth, being accompanied with a long period of existence, provided other circumstances are favourable to longevity.

* Hence the great age to which many of the French nobility lived, particularly before the regency of Orleans.

† See Easton on Human Longevity, Introduction, p. 11.

6. *Professions.* In the next place, it is evident that long life must depend much on the manner in which the individual is employed. Unhealthy occupations generally become fatal. Yet Peter Prin, a glass-blower, is said to have attained the great age of 101; and John Tyler, a miner at Leadhills, in Scotland, is supposed to have reached even 132 years*. His age, indeed, could not be proved by direct, but it rests on very strong circumstantial, evidence; and a person of the most undoubted authority, (Dr. Walker, Professor of Natural History in the University of Edinburgh,) informs me, "that in his muscles, joints, and in his whole conformation and aspect, he wore the appearance of more remote antiquity than he had ever seen in any human creature." But on the whole, farmers, gardeners, and labourers in the country, are in general the longest lived. Foot soldiers also, who have survived the dangers of war, are remarkable for long life. They are generally stout and vigorous men, and the regularity to which surviving soldiers must have accustomed themselves, whilst the careless and disorderly drop off, the erect posture to which they have been trained, and being of course men well formed by nature, and habituated to march and walk well, (which familiarizes them to a natural and healthy exercise,) all combine in their favour.

7. *Exercise or labour.* It is also proper to remark, that not only moderate exercise, but even labour, if not too severe, contributes to good health and old age. In many instances, persons have worked at threshing, and

* It is said that neither of these instances ought much to be wondered at, as a glass-blower is constantly exposed to fresh and dry air, and the labour of miners under ground is not for many hours, and they generally reside in hilly districts.

other laborious occupations, exposed to a current of fresh air, after they had passed beyond the age of 100, and, if accustomed to them, they do not appear to have suffered any inconvenience from such exertions.

8. *Connubial connections.* Nor ought it to be omitted, that a large proportion of the long-lived, have preferred a married to a single state, and in general have left behind them a numerous family. Whether a life of celibacy occasions disease, or leads to irregularity, or sours the temper, or to whatever other cause it ought to be attributed, may be a subject of dispute, but it is certain, that the number of single persons who live long, bear no proportion to the married*.

9. *Sex.* Farther, though a greater number of males are born than of females, at least in European countries, yet there is reason to believe, that of the two sexes, women reach old age in the greatest proportion. For this various causes may be assigned, as the greater regularity and temperance of their mode of living, their being less exposed to dangers and hardships, less subject to violent agitations, and generally endowed with more cheerfulness and gentleness of disposition.

10. *Renewal of youth.* In the last place, among the symptoms of longevity, none is more striking than when Nature seems to renew itself, by producing, even in old age, new teeth, new hair, &c. but the instances of this are extremely rare.

II. *Rules tending to promote long Life.*

We shall now proceed to state such rules as have been followed by those who have attained great age, as

* This applies to both sexes, in particular to the male. Dr. Rush of Philadelphia asserts, that he never saw but one unmarried man exceed fourscore years.

they may furnish some hints that may be serviceable to others.

The plan laid down by the celebrated Cornaro, is well known, and the abstemious manner in which he lived, has often been recommended to the imitation of others; but I question much whether many would wish to lead the same life, for the sake of mere existence. Life is no longer desirable than whilst it can be enjoyed with some degree of satisfaction, and it is of little consequence, if a person merely vegetates, whether he lives or not.

Without entering therefore into various particulars, fitter for the discussions of experimental philosophy, than for real life, (as weighing the food taken, &c. &c.) we shall proceed to mention the rules which have been found the most effectual, and which are the most likely to be carried into practice. They may be classed under the following heads:—1. Food. 2. Clothing. 3. Habitation. 4. Labour or exercise. 5. Habits or customs. 6. Medicine; and, 7. Disposition of mind.

1. *Diet.* The importance of wholesome food, for the preservation of health and long life, and the avoiding of excess, whether in eating or drinking, need not be dwelt upon. Some instances, indeed, are mentioned of persons who have continued to commit excesses; and have lived long; but these are to be considered in no other light than as exceptions from a general rule; and it may reasonably be contended, that if such persons lived to a great age, notwithstanding their intemperance, they would have lived much longer had they followed a different course,

2. *Clothing.* It is equally unnecessary to detail at any length, the necessity of warm clothing, more especially in advanced life, and during the cold seasons, as

the best mode of preventing a number of diseases to which old men are particularly exposed, and which, by no other means, can be avoided.

3. *Habitation.* The health of every individual must greatly depend on the place where he resides, and the nature of the house which he inhabits; and as it has frequently been remarked, that the greatest number of old people die in winter, and that many individuals, in a weak and consumptive state, are obliged to fly to warmer climates as the only means of safety, it has thence occurred to Dr. Pearson, that it would be of service both to the aged and to the consumptive, to have houses erected, of such a peculiar construction that the air could always be preserved, not only pure, but nearly of the same, and of rather an elevated temperature, so that the invalids who resided in them should never be affected by the vicissitudes of the seasons. Such an idea, it must be admitted, cannot be a general remedy or resource, but it is well entitled to the attention of those who are in affluent circumstances, by some of whom, it is to be hoped, an hospital for the aged and the consumptive will be erected, and the experiment fairly tried, both for their own sakes, and for that of human nature in general.

4. *Exercise and labour.* That either exercise or moderate labour is necessary even to aged persons, for the purpose of preserving the human frame in order, can hardly be questioned, provided any great exertion is avoided, than which nothing is more likely to destroy the springs of life, particularly when these become feeble. Travelling in moderation also, from the change of air and scene, has been found of great use.

5. *Habits and customs.* In the next place, good health, and consequently longevity, depends much on

personal cleanliness, and a variety of habits and customs, or minute attentions, which it is impossible here to discuss. It were much to be wished, that some author would undertake the trouble of collecting the result of general experience upon that subject, and would point out those habits, which, taken singly, appear very trifling, yet when combined, there is every reason to believe, that much additional health and comfort would arise from their observance.

6. *Medicine.* It is a common saying, that every man, after the age of 40, should be his own physician. This seems, however, to be a dangerous maxim. The greatest physicians, when they are sick, seldom venture to prescribe for themselves, but generally rely on the advice of their medical friends. Persons who pretend to be their own physicians, are generally much addicted to quackery, than which nothing can be more injurious to the constitution. It is essential to health, that medicines should never be taken but when necessary, and never without the best advice, in regard to the commencement, which ought not to be too long delayed, otherwise much benefit cannot be expected from them, and also with respect to nature or sort, quantity, and continuance.

At present, the powers of physic, it is generally acknowledged, are extremely bounded. The medical art, however, is probably still in its infancy, and it is impossible yet to say, to what perfection it may reach, not only in consequence of the new improvements which chemistry daily furnishes, but also of those which may be made, by the discovery of new and valuable plants, in countries either already known or hitherto unexplored, and indeed the new uses to which old medicinal plants may be applied. Perhaps such discoveries will be much accelerated, when, instead of being left to the

zeal and industry of individuals, they shall meet with that public encouragement and protection, to which they are so peculiarly well entitled.

7. *Disposition of mind.* In the last place, nothing is more conducive to longevity than to preserve equanimity and good spirits, and not to sink under the disappointments of life, to which all, but particularly the old, are necessarily subjected. Indeed, this is a point which cannot be too much inculcated, for experience sufficiently demonstrates, that many perish from despondency, who, if they had preserved their spirit and vigour of mind, might have survived many years longer.

III. *Countries remarkable for Longevity.*

The countries the most remarkable for long life are those of a hilly nature. We are informed by Pallas, that the inhabitants of the mountainous districts of the province of Ilesk, in the northern parts of Siberia, live to a great age; that people of 100 years are very common; and that he saw an invalid soldier aged 120. The inhabitants of the plains in their neighbourhood, are, at the same time, by no means so healthy or so long lived. Buffon places the mountainous districts of Scotland at the head of a list containing those parts of Europe the most distinguished for longevity; and, indeed, there is no country in Europe, where, in proportion to its population, a greater number of individuals reach to 60, and thence to 80, and even 90 years of age, in full possession of all their faculties, both personal and mental, than is the case in that part of Great Britain*.

There

* In a work containing a collection of instances of longevity, for no less a period than 1733 years, namely, from A. D. 1066 to 1799, (by J. Easton) in which there is given the name, age, place of residence, &c. of 1712 persons, from all parts of the world, who had attained to a century and upwards, 170 are stated to have been natives

There is also every reason to believe, that many of the departments of France and the mountainous districts of Germany, Hungary, Sweden, Norway, and even those of Spain, Portugal, Italy, and America, will produce extraordinary instances of longevity, whenever any particular enquiry is made regarding that interesting circumstance.

IV. *Tables of Longevity.*

Having thus discussed the subject of Longevity in general, it may not be improper to lay before the reader the following table, explaining the shortness of human life, and pointing out how few there are, in proportion to the number born, who reach even the period of 60 years*.

Of a hundred men who are born, there die, according to Hufeland,

Under	10	-	-	-	59
Between	10 and 20	-	-	-	20
	20 and 30	-	-	-	10
	30 and 40	-	-	-	6
	40 and 50	-	-	-	5
	50 and 60	-	-	-	3
					94

tives of Scotland, and the two most remarkable in the whole list are Kentigern, a native of Scotland, and Peter Torton of Temeswar, in Hungary, both of whom attained the great age of 185 years. This Kentigern, also known under the name of St. Mungo, was the founder of the Bishopric of Glasgow. The following verses were made on his extraordinary age and place of interment :

“ Cum octogenos centum quoque quinque vir annos

“ Complerat, Sanctus est Glasgou funere functus.”

Spottiswood's Hist. of the Church of Scotland, p. 11, & 112.

* On the Art of prolonging Human Life; a work written by Professor Hufeland of Jena, in Germany.

Hence

Hence it would appear that there are only six out of a hundred, who stand a chance of living beyond 60 years.

Of persons who have lived above a hundred years, the industrious Haller has collected 1113 instances, and gives the following statement of the duration of their lives*.

Of those who lived from 100 to 110 years, the instances have been above	-	-	-	1000
From 110 to 120 about	-	-	-	62
120 to 130	-	-	-	29
130 to 140	-	-	-	15
140 to 150	-	-	-	5
152 (Parr)	-	-	-	1
169 (Jenkins)	-	-	-	1
				<hr/>
				1113

But in a recent publication, the following table is given as the result of a more extensive collection of instances of longevity.

Of males and females, who lived from 100 to 110 years, both inclusive, the instances have been 1310

Above 110 to 120	-	-	-	277
120 to 130	-	-	-	84
130 to 140	-	-	-	26
140 to 150	-	-	-	7
150 to 160	-	-	-	3
160 to 170	-	-	-	2
170 to 185	-	-	-	3
				<hr/>

1712†

* Haller's *Elementa Physiologiae Corporis Humani*. Vol. VIII, lib. xxx. sect. 3. p. 103.

† See Eafon on Longevity, printed an. 1799.

CONCLUSION.

Such is the substance of the observations which have occurred to me on this interesting subject. I shall conclude with remarking, that on the whole, it is more than probable, by proper attention and good management, persons in general, might not only live longer, but might enjoy life with more relish, than is commonly the case at present; and it is to be hoped, in respect of this, as well as of many other particulars, that human nature is still in the threshold of acquirement, that it will yet obtain greater and more important acquisitions of knowledge, and may reach further improvement, both with regard to the extent of personal and mental gratifications, which our species may be found capable of enjoying, and also the means of possessing them, with more satisfaction and comfort, and for a much longer period of time.

APPENDIX.

No. I.

THE preceding observations are only intended as a basis, for the purpose of obtaining the additional facts and observations which are necessary to elucidate so important an inquiry. It is particularly requested, therefore, that the following questions may be answered with as much minuteness and accuracy as circumstances will admit of.

Questions for the consideration of those intelligent persons, by whom this Paper may be perused.

1. What is the effect of the climate in which you reside, on the health and longevity of the human race?

2. What form is reckoned most conducive to health and longevity?

3. Is it found, that being descended from young and from healthy parents, is essential for good health and old age?

4. Is it found, that health and old age depends much on the disposition or temper of the individual?

5. Is there any perceptible difference in consequence of situation of life?

6. What professions are reckoned favourable to longevity or otherwise?

7. Is exercise or moderate labour found necessary for preserving health and long life?

8. Have the long-lived in general been in the marriage state?

9. Have the greatest proportion of the long lived consisted of males or females?

10. Have there been any instances of persons renewing their age, getting new teeth, new hair, &c.?

11. What

11. What are the other circumstances tending to promote long life ?
12. What is the effect of diet on health and longevity ?
13. What are the effects of clothing ?
14. What the effect of habitation, and the difference of living in a town or in the country ?
15. What are the effects of habits and customs, in regard to early rising, bathing, regular meals,—regular sleep,—and, in particular, what are those minute circumstances on which it is supposed that health and longevity principally depend ?
16. What are the rules regarding medicine which are accounted the most useful and salutary ?
17. What are the most remarkable instances of longevity, and how are they authenticated ?
18. What are the rules adopted by those who have attained great age ?
19. Have any tables of longevity been drawn up in your neighbourhood, and how do they agree with the one extracted from Hufeland ?
20. Do any additional observations or particulars occur to you on the subject of health or longevity ?

No. II.

Of such Rules and Habits as may contribute to the Preservation of good Health and long Life.

IF persons were to live with the simplicity of ancient times, it is probable that they would attain long life, without experiencing any material illness, merely by a proper attention to air, exercise, clothing, and diet. But in the present state of society, the great bulk of the community must follow, not a natural, but an artificial mode of life, and thence are perpetually exposed to various temptations, which they find it difficult always to resist, and to dangers which they cannot always avoid. In luxurious times, therefore, persons in general cannot

cannot expect to live long, at least with any degree of satisfaction, unless by great care, and by an attention to a variety of minute particulars, which they either learn from others, or acquire by their own experience. The mass of useful facts and observations thus accumulating every day, and perishing daily with those who had acquired them, must be very great. Unfortunately, hitherto, no individual has taken the trouble of collecting them. Such a collection would certainly be a most acceptable offering to the public, more especially if written in a plain and distinct manner, and laying down such rules alone as were practicable according to the general style of modern life. With the view of contributing to so useful a work, I shall proceed to state such observations as have been either communicated to me by others *, or have occurred to myself on that interesting subject.

The

* Among other communications I received from a friend in the country, a number of rules of diet and regimen, written in Latin as far back as the year 1648, in answer to the general question; "By what means a person might be enabled to prolong life to the latest period?" The following is a literal translation of that Paper:

A person will be enabled to prolong life to the latest period, by observing the following salutary rules.

1. The stomach ought never to be over-loaded with food, otherwise the body will be rendered unfit for exertion.
2. Moderation in exercise, food, drink, sleep, and venery.
3. No fresh food should be taken, unless the preceding meal has been properly digested.
4. The meals should not be uniform; but supper always lighter than dinner.
5. Excess in former meals must be corrected by a subsequent abstinence.
6. All food should be duly masticated before it be swallowed.
7. The quantity of drink should always be proportioned to that of solid food.
8. No drink should be taken until a due portion of solid food has been swallowed.
9. A variety of dishes ought not to be eaten at the same time.
10. It will be advisable to refrain from a meal (dinner) once a week, particularly when the body appears to require less food.

The particulars connected with food, clothing, habitation, air, and exercise, are so universally known, and the principles regarding

11. Bodily exercise should be so managed once a day, as to excite the natural heat (glow); and before a meal. The advantages resulting from such practice are thus described by FULGENTIUS: "Exercise," says he, "contributes to the preservation of human life, it dissipates all superfluous humours of a plethoric habit; it invigorates our faculties; it is a gain of time; the enemy of idleness, the duty of the young, and the delight of the aged. For exercise disengages and expels, through the pores, all superfluous humours; while the greatest injuries may ensue from a contrary conduct: hence the poet observes, "Ease is not to be acquired unless it be combined with toil. For idleness is generally attended with dissolution."
12. In taking food, liquids and soft substances ought to precede those of a dry and solid nature.
13. Between meals, both solid and liquid food should be avoided.
14. The bowels should be regular every day, either by nature or by artificial means.
15. Extremes of heat and cold, with respect to food, drink, and air, are equally to be guarded against.
16. Sleep ought not to continue less than six hours, nor exceed eight.
17. Immediately after a meal, and with a full stomach, it is hurtful to engage in reading, writing, or deep reflections.
18. Violent exercise, shortly after a meal, ought never to be undertaken.
19. When the body is in a languid state, all the limbs should be vigorously stretched.
20. Drink should never be taken on an empty stomach; as, in that state, it cannot fail to prove exceedingly hurtful by agitating the nerves. Galen says, in the second Aphorism, 21, if a hungry person drink wine before he eat, he will speedily be attacked with spasms and delirious symptoms. Nor should wine be taken (habitually) after meals; because it unnaturally accelerates the digestion, propels the food before it is properly digested, and lays the foundation of obstructions and putridity.

regarding each so fully established, that it is surely unnecessary to dwell upon them at any length.

In regard to food, experience will point out those articles, which are best adapted for the constitution of each individual, and there cannot be a better general rule than to adhere to them as closely as possible. It may be observed, however, that people in general, especially those who do not labour, eat much more than nature requires; that a little abstinence or self-denial may often be of use, either to prevent or to cure disease*; and at any rate, that none but hard-working people, or those who are in the very prime of life, or growing fast, or travelling about, should eat more than one full meal each day.

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21. Wine should never be taken immoderately; and it would be advisable, as much as possible, to abstain from its use, because it affects the brain; hence, no person of a weak organization should venture to drink it, unless in small quantities, or diluted. Serapio remarks, "Wine fills the head with many vapours."
 22. The bread should be of the best quality, soft, (not too stale,) and mixed with a small portion of salt.
 23. Cheese, and all the artificial preparations of milk, ought to be avoided; though pure milk, when mixed with sugar, may not be deemed unwholesome during the summer. Milk and water, or whey, is a salutary beverage at all seasons.
 24. Fish should be seldom eaten, and then they ought to be tender and well dressed, with the addition of vinegar, spices, and other sauces.
 25. Oysters, and all shell-fish, should be avoided, because they afford only a cold, slow, and viscous nourishment."

There are many useful hints in these Rules, though some of them are not applicable to general use, according to the modern stile of living.

* After a disease is removed, if there is much lassitude and weakness, nothing will be found more useful than to take a crust of bread, and a glass of very old and rich sweet wine at noon. This plan was strongly recommended to me by some intelligent persons on the Continent, who had reaped much benefit from it.

As to clothing, much must depend on situation and climate *; but, on the whole, it is generally found a useful practice to wear woollens next the skin. It is remarked in many parts of Scotland, that since the use of flannel shirts has been given up by the lower orders, that the rheumatism, and other diseases formerly unknown, have become very frequent, and are daily increasing. In the West India Islands, if care be taken to make the troops wear flannel shirts, they are likely to be exempted from various disorders, which otherwise would probably have attacked them. Even the negroes themselves, I understand, prefer flannel to cotton or linen, and find it a much more comfortable and useful dress. In regard to clothing suited to the climate of Great Britain, there is reason to believe that we use furs much seldomer than we ought to do. Nothing can be more absurd than to consider the use of fur as a mark of effeminacy, and on that account to suppose that it is merely calculated for delicate women. In the piercing cold to which we are often subjected, furs might be worn with much advantage, by the stoutest and hardiest men.

The nature of the house where any individual resides, is a very important consideration. Formerly they were very ill fitted up, and were what would now be considered extremely uncomfortable. It was said of old, that no house was wholesome "where a dog could not get in under the door, or a "bird through the window." There was then no use for ventilators. The case is now much altered. The art of finishing houses closely, and the management of fuel, have been brought to such perfection, as greatly to exclude a free circulation of air, and to overheat that which the room contains. From the great expence of building and fitting up houses also, the apartments in them are in general much smaller, and less lofty than they ought to be. As it is impossible to make any great alteration in these particulars, more especially in the metropolis, and in large towns, which contain so large a proportion of the population of the kingdom, the only remedies

* See an Essay, Philosophical and Medical, by Dr. Vaughan, concerning Modern Clothing. Printed *an.* 1792.

are, to ventilate the houses whenever the weather will admit of it; and for the inhabitants of towns to be as much in the open air, and as frequently in the country, as circumstances will permit*.

In regard to exercise, it cannot be too much recommended; and as, from various circumstances, persons in large towns, and engaged in various sedentary occupations, cannot take all that exercise abroad that may be necessary for their health, they ought as much as possible to accustom themselves to be walking about even in their own house, instead of sitting so much as is usually the case. This rule is peculiarly necessary to be attended to by literary men; and though such a practice does not make up for the want of exercise abroad, yet it certainly is the best substitute for it.

But the principal object of any extensive paper on this subject, should be to point out those habits, or minute particulars, which contribute to good health and old age. We frequently see persons living luxuriously, and keeping even irregular hours, without being much troubled with disease. It is not improbable, were the truth known, that this is owing to trifling attentions, the result of observation and experience, which prove of infinite service to them, and which might be of equal advantage to others, were they collected by some public-spirited individual, and universally disseminated.

I believe there is no habit that contributes more to good health and good spirits, or renders a man fitter for going through a great deal of business than that of taking a sufficient quantity of sleep, from six to eight, and even nine hours, if nature requires it. I understand that the late Lord Mansfield frequently inculcated the advantages to be derived from a rigid adherence to such a system; and it is well known the quantity of business he went through, and the good health and good spirits he enjoyed for a great number of years. To continue

* It has been remarked, that persons residing in Scotland in summer and in England in winter, generally enjoy excellent health; and it is believed that nothing would tend more to promote the health of the citizens of London, than an annual excursion to the mountains of Wales, or the Highlands of Scotland.

long in bed without sleeping, is weakening and injurious; but a person may take all the repose that nature requires, and will have time sufficient, during the remainder of the day, to go through all the necessary business, and to enjoy all the real pleasures of life.

It is generally supposed, that early rising is also essential to good health *. Without being an advocate for what are called fashionable hours, which are carried to so preposterous an excess, converting night into day, and day into night, some doubts may be expressed regarding the propriety of carrying the opposite system to too great a height. In ancient times, when people depended almost entirely on the sun for light, they were under the necessity of rising with that luminary, and of going to bed when it disappeared. Hence a prejudice arose in favour of that practice; but the case is greatly altered since the means of obtaining artificial light to so great an extent has been discovered. I question much, whether the morning air is so wholesome as many imagine. The sun must necessarily extract from the earth, when it first appears, a variety of vapours, which strong constitutions may withstand, but which must be injurious to weak ones: even in large towns, it is some time before the morning fogs are dissipated. On the whole, late rising cannot be approved of, but very early rising is not probably so essential for health as is commonly imagined.

There is nothing that can tend more to long life than for a person to obtain a complete command of his passions, and in particular to preserve his mind from being ruffled. Perhaps there is no maxim more likely to promote good health, than that of paying a proper attention to *temper, temperance, and sleep*. By good temper, the mind is preserved from disease; and by temperance, the body; and both the mind and the body, when exhausted, are again recruited and restored to their former strength, by a sufficient quantity of repose.

In so variable a climate as that of the British Isles, it is of

* The old maxim was,

Early go to bed, and early rise,
Makes a man healthy, wealthy, wise.

the utmost importance to contrive the most effectual means of preventing various disorders arising from checked perspiration, as colds, coughs, consumptions, sore throats, rheumatisms, &c. by which so many thousands are cut off every year. The following hints are the result of some attention to that particular subject.

1. It is generally acknowledged that the use of flannel next the skin is a great preservative against catching cold, and all the disorders connected therewith. This is a point so well established that it is unnecessary to dwell upon it*.

2. There is not a better mode of being able to withstand the variableness of our climate, than to adopt the Spanish practice of wearing an under waistcoat made of thin shamoy leather, which tends to preserve the body in an equal temperature. This is particularly useful when persons are in a weak state after indisposition, or are likely to be affected with rheumatic complaints.

3. Many persons are apt to be frequently attacked by complaints in the throat, which may, in general, be prevented by attention to the following circumstances. It is usual for persons to make use of hot water for shaving, the consequence of which is, that the glands of the throat are much relaxed, and very apt to be affected by cold. It has been found by experience an excellent custom to use cold instead of hot water, though the latter may be employed in warming the razor, which adds to the comforts of shaving. Persons apt to have sore throats, if they suspect they have caught cold, should, as soon as possible, gargle their throats with spirits, which may also be applied with much advantage to the outside of the throat.

4. Persons who hunt or ride much, are greatly exposed to get wet, and catch disorders in consequence thereof, of which multitudes of all ages have perished. The remedy, however, is a very simple one. Whenever such a circumstance hap-

* The principal objection to wearing flannel is its tendency to excite too great perspiration in bed; but this is easily obviated by wearing a flannel waistcoat with buttons at the shoulders, so that it can be taken off at any time without inconvenience.

pens; particularly to any person not accustomed to get wet, he should as quickly as possible rub his feet with a towel, dipt in rum or any other sort of spirits, the effect of which, in restoring the animal heat of the whole body is almost instantaneous. This practice, I understand, has been found of the greatest service abroad, and the great Frederick of Prussia recommended it strongly to his soldiers to adopt it, though, in general, they were much more inclined to drink their brandy than to make this use of it.

The next particulars which it may be proper to advert to, are the skin, the teeth, and the eyes.

It is well known that the health of the individual depends much upon the state of the skin, and that good health can never be enjoyed unless when it performs its functions properly. For that purpose, it is necessary that it should be kept in a clean state. The attention paid to this subject by ancient lawgivers and founders of religious systems, cannot be too much commended. They actually made the keeping the body clean, by frequent washing, part of the sacred duty of each individual. The use of linen, and the custom of throwing off the dress of the day, when going to sleep, (which is not the case with Asiatic, but fortunately is now so general with European nations,) renders bathing much less essential, but still the practice is too much neglected in this country; and in large towns furnishing the people with the means of bathing commodiously, ought to be a part of the general police*.

It is impossible too strongly to recommend an early and constant attention to the teeth. In former times, when persons lived with great simplicity, the teeth seldom failed, until the body was on the verge of dissolution; but now, it is hardly to be credited, how few pay such attention to their teeth as will preserve them in any tolerable order for a long period. This is the more surprising, as a good set of teeth is so ornamental, so essential for distinct pronounciation, and so necessary for a proper mastication of the food. In a paper of this de-

* The shower baths, and washing the body with wet sponges, have been found of great use in various complaints, and a great preservative against catching cold.

scription, it is only possible to touch upon this important subject. It may be proper, however, to observe, a common mistake, that tooth-brushes, as they are called, are intended for rubbing the teeth, whereas their proper business is to rub the gums, and to excite a circulation there. It is diseases in the gums that principally occasion the destruction of the teeth, and preserving the one in good order materially contributes to the safety of the other*.

The little attention that is shewn to the preservation of the eyes, is fully as blameable as the negligence above alluded to in regard to the teeth. Any imperfection in the sight is such a calamity, that every person of common prudence would certainly wish to prevent it by every possible means; and there is certainly no mode more likely to be effectual, than that of bathing them night and morning in a basin of cold water, and opening the eyes in the water. Any disorder that attacks the eye itself, from the pain and uneasiness which it occasions, must be attended to. But the eye-lids become often diseased and ulcerated, and though there are various ointments which would cure this disorder at the commencement, yet, as it is not very bad or troublesome, people are too apt to put it off from time to time, until the eye itself is affected, and a cure becomes hardly practicable.

It is imagined by some, that taking of snuff is a useful practice in preventing disorders in the head, and in the eyes in particular; and in the list subjoined of the In-pensioners in Greenwich Hospital who have exceeded the age of 80 years, a very large proportion use tobacco in some shape or other. The taking of snuff is certainly refreshing, and loaded as it is with a heavy tax, it still is a cheap luxury for the poor; and the evidence from Greenwich Hospital sufficiently proves, that the use of snuff and tobacco, though not to be universally recommended, yet is not incompatible with long life.

* Some people have their teeth so regular and well set, that little attention is necessary; but wherever there is any irregularity, nothing but the greatest care, and the skill of an able dentist, can preserve them long.

In a book published on the subject of longevity *, some circumstances are occasionally mentioned regarding the food and habits of persons who lived to a great age. Among these, the following seem to be the best entitled to notice ; “ 1. John Hufsey, of Sydenham, in Kent, who lived to be 116. For above 50 years his breakfast was balm tea sweetened with honey, and pudding for dinner, by the use of which he acquired long and regular health. 2. Judith Bannister, aged 108. She lived upon biscuit and apples, with milk and water, the last 60 years of her life. 3. John Riva, of Venice, aged 116, always chewed citron-bark. 4. Elizabeth Macpherfon, of the county of Caithness, aged 116. Her diet was buttermilk and greens. 5. Francis Confit, of Burythorpe, near Malton, Yorkshire, aged 150, occasionally eat a raw new-laid egg. 6. Fluellyn Price, of Glamorgan, aged 108. Herb teas were his breakfast, meat plainly dressed his dinner, and instead of a supper, he refreshed himself with a pipe of tobacco. 7. Val. Cateby, of Preston, near Hull, aged 116. His diet for the last twenty years was milk and biscuit. 8. Edward Drinker, of Philadelphia, aged 103. He lived on very solid food, drank tea in the afternoon, but eat no supper. 9. Lewis Morgan, of Radnorshire, aged 101. He lived chiefly on vegetable diet, and drank frequently of the famous rock water of Llandridod. 10. Mr. Smith, of Montgomeryshire, aged 103. He was never known to drink any thing but buttermilk. 11. William Riddle, of Selkirk, in Scotland, aged 116. For the last two years of his life, his chief subsistence was a little bread infused in spirits and ale. 12. Honourable Mrs. Watkins, of Glamorganshire, aged 110. For the last 30 years she subsisted entirely on potatoes. 14. Rebecca Joseph, of Monmouthshire, aged 100. Her chief subsistence, for the last two years of her life, was brown sugar and cold water. 14. Charles Macklin, Esq. of London, aged 107. For the last 40 years of his life, his principal beverage was white wine and water, made pretty sweet ; and after he had lost his teeth, his food principally consisted of fish, eggs, puddings, and spoon meat.

* By Mr. James Easton, of Salisbury, printed in 8vo, *an.* 1799.

Having been attacked by a severe fit of the rheumatism, he discontinued the use of sheets, and slept in blankets. He used to be frequently rubbed all over with warm brandy or gin, (which seems to be a good practice for aged people,) and occasionally steeped his feet in warm water. It was his custom not to sleep on a feather bed, but on a matras, on a couch without curtains, placed in the center of the room, upon which he reposed whenever he found himself sleepy. Instead of attending to regularity, he observed the dictates of nature, eat when hungry, drank when thirsty, and slept when nature seemed to require repose."

Among practices which might be of service to aged people, I should imagine that rubbing the body with oil would be particularly useful. It might tend to preserve the skin in a soft and healthy state, and to furnish the body with that unctuous matter, which very old people seldom have to the extent that is necessary; and hence those wrinkles which are so peculiar a characteristic of old age.

I am also persuaded, that in regard to various disorders, particularly those with which the aged are apt to be afflicted, a great source of benefit still remains to be explored, in the practice of electricity, by the use of which, not through the medium of violent shocks, but by gradually diffusing that important fluid throughout the whole frame, the body is re-animated with fresh vigour, and rendered fitter to go through its various functions with renewed spirit and strength.

There is certainly nothing that would tend more to preserve health and longevity, than improvements in the medical art, which, though it has made considerable progress in some particular departments, yet continues deficient in many others. When it is considered the number of able men who are employed in the medical profession, the importance of the objects to which their attention is directed, and the multitude of cases which are daily, and even hourly coming under their review, one would think that hardly a circumstance could possibly happen that might not be foreseen and guarded against. Perhaps one mode of improving the art would be, requiring all physicians to communicate to the College an account of

any ease that seemed to throw light upon the mode of curing any particular disease. Honorary premiums might be given to those who make any useful discovery; and it is to be hoped that the munificence of Parliament to Dr. Jenner, will shew what may be expected by medical men who make any improvement of real and essential importance.

I shall conclude with observing, that man has been compared, and with some truth, to a machine; but he ought not to be considered as a machine that wears out by mere use, without the possibility of being repaired; but like one whose movements may be improved, whose wheels, after being disordered, may be again put into their former, and perhaps even an improved state, and whose frame may be long preserved by care, by attention, and by the ingenuity and exertions of skilful artists.

No. III.

On the Longevity of the Pensioners in Greenwich Hospital.

BEING convinced that much light would be thrown on the subjects of health and longevity, were accurate returns made from Hospitals and other public institutions, of the diet, age, and other particulars regarding the persons who resided in them, I was thence led to apply to Greenwich and Chelsea Hospitals for such information; and it is with much pleasure that I subjoin the following important facts with regard to Greenwich Hospital, which Dr. Robertson, at the desire of the respectable Master of that most excellent Institution, (Lord Viscount Hood,) transmitted to me.

I propose, first, to give the Tables as prepared by Dr. Robertson, and then such observations as may occur on the results to be drawn from each of them respectively.

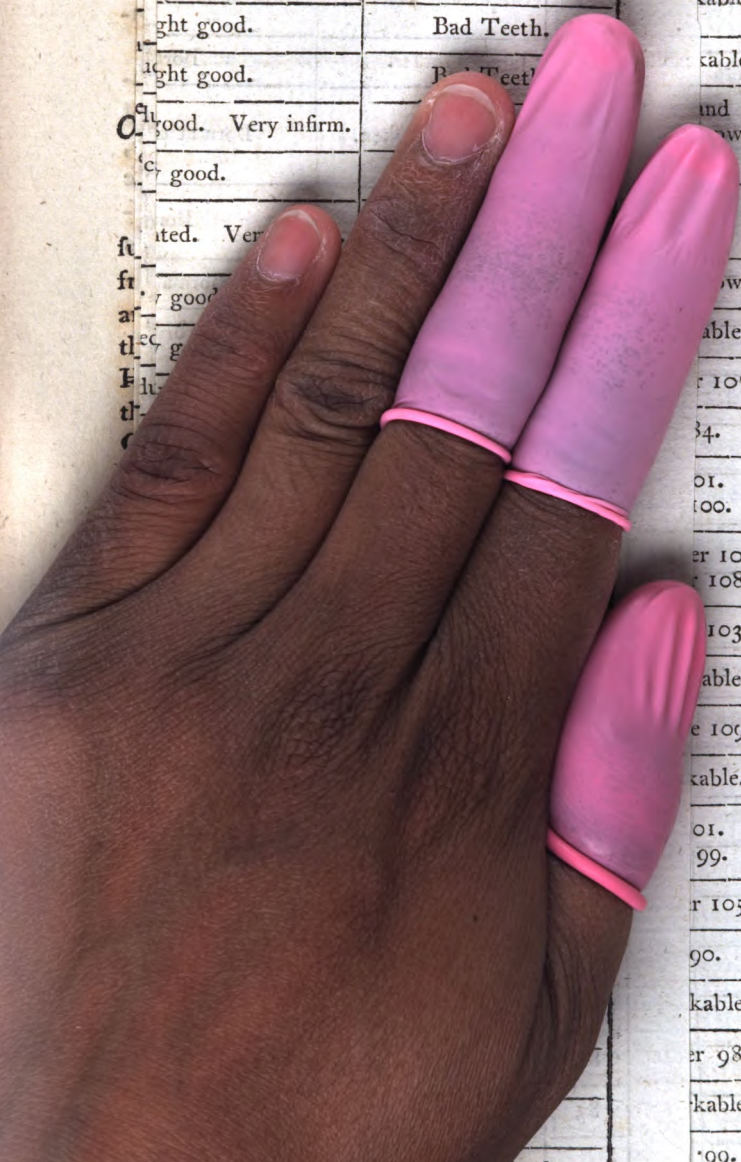
<i>Age.</i>	<i>Names of Pensioners upwards of 80 Years of Age.</i>	<i>Where such Persons were born and ed</i>
86	George Forbes.	Born and educated at Aberdeen, Nort
85	Richard Oldston.	Born at Norway. No educatio
81	Peter Eager.	Cumberland, but removed to Ireland in
82	Edward Collins.	Born and educated at Barking, E
82	George Diffiny.	P educated at Chifwick, Mid-
83	William Wright.	educated at Bristol.
92	Edward Skinner.	at Dartford, K
98	Daniel M'Neal.	N. B. an
82	Jeffery Moore.	re, an
87	Nathaniel Chapm	nd ed
81	Robert Hannawa	ated
102	John Moore.	
91	Daniel Cov	
89	John Hut	
95	John Jackfo	
83	John Blackwe	
90	John M'Pearse	
94	Thomas Lanfd	
80	James Archer.	
85	Adam Malcum	
84	Thomas Vaugh	
80	John Carbery.	
81	Ifaac Rutter.	



<i>The state of their Organs, and Mental Faculties.</i>	<i>The state of their Teeth.</i>
Very dim-sighted. Hearing bad.	Bad Teeth.
Middling eye-sight. Hard of hearing.	Bad Teeth.
Rather dim-sighted. Otherwise good.	Very bad Teeth.
Very dim-sighted. Otherwise good.	Middling Teeth.
Very dim-sighted. Otherwise good.	Middling Teeth.
Very hard of hearing.	Middling Teeth.
Very hard of hearing.	Bad Teeth.
Ditto, and blind of one Eye.	Middling good Teeth.
Dim-sighted. Very infirm.	Bad Teeth.
Dim-sighted. Very infirm.	Not a Tooth left.
Very deaf. Otherwise very good.	Front Teeth pretty good.
Rather dim-sighted. 4 new Teeth—3 lost.	Bad Teeth.
Very good.	Good Teeth.
Sight bad.	Not a Tooth left.
Very short of breath.	Not a Tooth left.
Very infirm.	Not a Tooth left.
Very good.	Not a Tooth left.
Very dim-sighted.	Middling good Teeth.
Very good.	Not a Tooth left.
Dim-sighted and Palsy.	Not a Tooth left.
Quite blind. Otherwise good.	Not a Tooth left.
Dim-sighted.	Not a Tooth left.
Very dim-sighted. Otherwise good.	Bad Teeth.

<i>Age.</i>	<i>Names of Pensioners upwards of 80 Years of Age.</i>	<i>Where such Persons were born and educ.</i>
80	Thomas Kindred.	Born at Dublin, in Ireland, and educ
80	William Lee.	Born in St. James's, London, and edu
81	William Gammon.	Born in London, and educated.
82	Thomas Grisley.	Born at Bishopgate, London, and ed
82	John Mager.	Born at Wells, in Somersfetshire, and eq
82	John Biggs.	Born at St. Martin, London, and edu
84	John Wellers.	Born in London, and educated.
84	William Smith.	Born at Stepney, and educated
85	Robert Padgett.	Born at Hammerfmith, Middlefex, and
85	Thomas Fowler.	Born at Walthamftow, in Effex, and ec
86	Will. Rowelington.	Born at Alderfgate, London, and edu
94	John Garvis.	Born at Kiderminfter, in Worcefterfhire, and
82	John Beaves.	Born at Colton, in Devonshire, and ed
90	Owen Murrey.	Born at Tyrone, in Ireland, and educ
86	Henry Hill.	Born at Bromley, in Surry, and educ
83	James Hillhouse.	Born at Air, in Scotland, and educa
84	Robert Griffiths.	Born at St. George's in the East, and e
80	Francis Hopkins.	Born at Gloucefter, in America, and eq
80	Isaac Smith.	Born at Whitehaven, in Cumberland, and
82	John Harford.	Born at Stokedameral, in Devonshire, and
80	Thomas Griffiths.	Born at Swanfea, in Wales, and educ
83	Nathaniel M'Nichols.	Born at Kilponar, in the Highlands, and
80	William Jeffrey.	Born at Stepney, and educated!
81	John Webb.	Born at Exeter, and educated.

<i>Organs, and Mental Faculties.</i>	<i>The state of their Teeth.</i>	<i>How long they lives were d.</i>	<i>How in the King Serv</i>
aged. Very infirm.	Bad Teeth.	e 86.	20 ye
insensible.	Bad Teeth.	kable.	24 ye
ight good.	Bad Teeth.	kable.	21 ye
ight good.	Bad Teeth.	und mo- wards	30 ye
good. Very infirm.			11 ye
good.			32 ye
ited. Ver			22 ye
good		107.	32 ye
cc g		84.	12 ye
lu		01. 00.	22 ye
th		er 105. 108.	25 ye
		103.	14 ye
		kable.	30 ye
		e 109.	12 ye
		kable.	11 ye
		01. 99.	24 ye
		r 105.	48 ye
		90.	20 ye
		kable.	30 ye
		er 98.	14 ye
		kable.	16 ye
		00.	67



Observations on the above Table.

Doct^r Jame^son, of Bloomsbury-place, has made the following remarks on the preceding Table :

“ Dr. Robertson certainly deserves much praise for his attention in transmitting so particular a statement of the longevity of Greenwich Hospital; and if something similar could be procured from other public institutions in Great Britain and Ireland, it would not be difficult to form an arrangement of facts, that would afford important conclusions concerning the lives of mankind.

“ The Table communicated by Dr. Robertson favours an opinion, that the watery element is not unfriendly to the human frame, especially when it is aided in advanced life by the comforts of Greenwich Hospital.

“ The list of ninety-six men in that Hospital still alive, in extreme old age, is uncommonly great; and it appears from the table, that there is one man living above a hundred years old, and 13 above 90 years of age.

“ That the greatest number are natives of Scotland, and a large proportion from Ireland.

“ That one half belonged to aged families, many of whom had both parents very old.

“ That more than two-thirds had been upwards of 20 years in the King's service, and in various climates;

“ That they were almost all married, and four of them after 80 years of age.

“ That they almost all used tobacco, and most of them acknowledged the habit of drinking freely.

“ That the parts of the human body which had most generally failed, were the teeth. Some of them had no teeth for 20 years, and 14 only had good teeth.

“ That the organ of vision was impaired in about one half, and the organ of hearing in about a fifth part of them.”

As Doctor Robertson proposes publishing a new edition of his interesting work on the Diseases incident to Seamen, it was unnecessary to touch upon that branch of the inquiry. He has very obligingly, however, communicated the following additional observations, connected with the subject of longevity in general.

1. The number of In-pensioners being 2,410, and the number of those who are from 80 years of age and upwards being 96; the proportion of the aged to the whole is only as $\frac{1}{25}$ less than $\frac{1}{23}$.

2. Some use tobacco for particular complaints, which they think are relieved by the use of it, or use snuff; and the rest say that they cannot do without it.

3. John Moore (the oldest man in the house) says, that he has had four new FORE teeth within these five years; one of which he has lost he knows not how. This is commonly accounted a great mark of old age.

4. The proportion of aged marines is $\frac{1}{25}$, or $\frac{1}{23}$ of the whole number of persons above 80 years of age, in the Hospital.

5. The number of Out-pensioners is about 2,500, to whose ages when they were admitted, the number of years they have been on the list being added, it appears there are only 23 from 80 years of age and upwards; a sufficient proof of the great attention paid to the health of the In-pensioners at this excellent institution.

6. The number of ruptured men among the In-pensioners, on the 3d of May, was 161, or $\frac{1}{15}$, the number being 2410. the Out-pensioners, amounting to 2500, the number was only Among about 50, or nearly $\frac{1}{50}$.

ROYAL HOSPITAL AT GREENWICH.

Deaths of Pensioners from 1st January 1782 to the 31st December 1798, inclusive, the Complement being 2350.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Number in each year.
1782	16	19	15	21	24	31	18	16	16	16	17	19	228
—83	18	15	17	14	12	17	13	15	16	17	15	19	188
—84	17	25	21	25	22	14	13	6	6	10	10	17	186
—85	20	16	14	16	14	18	21	19	15	15	10	17	195
—86	11	20	20	12	13	20	8	18	15	17	24	8	186
—87	30	14	12	20	11	16	14	11	14	16	27	21	212
—88	13	15	22	20	13	11	16	15	15	14	12	26	192
—89	27	23	15	18	16	14	15	13	18	21	12	11	203
—90	15	12	10	14	22	11	15	21	10	13	21	15	179
—91	18	19	18	20	22	25	21	14	12	16	13	20	218
—92	21	15	24	11	14	16	13	12	12	13	17	20	188
—93	23	15	17	10	19	8	14	11	13	17	15	16	178
—94	33	15	13	16	14	17	16	14	19	13	13	26	209
—95	32	27	45	24	24	15	15	12	18	14	11	11	248
—96	19	13	10	23	17	12	8	13	10	13	12	23	173
—97	14	25	13	19	26	20	17	9	13	20	23	21	220
—98	18	21	25	20	20	17	15	16	17	14	15	24	222
Total	351	309	311	303	303	282	252	235	239	259	267	314	17)3425
													201 $\frac{3}{7}$

ROYAL HOSPITAL AT GREENWICH.

Deaths of Pensioners from 1st January 1799 to the 31st December 1801, inclusive, the Complement being 2410.

<i>Year.</i>	<i>January.</i>	<i>February.</i>	<i>March.</i>	<i>April.</i>	<i>May.</i>	<i>June.</i>	<i>July.</i>	<i>August.</i>	<i>September.</i>	<i>October.</i>	<i>November.</i>	<i>December.</i>	<i>Number in each year.</i>
1799	23	20	23	23	36	16	12	11	20	14	12	26	236
1800	25	19	17	19	8	15	7	15	26	23	19	15	208
1801	18	9	15	20	9	15	11	15	16	13	16	17	174
Total	66	48	55	62	53	46	30	41	62	50	47	58	3)618
													206

The following observations have occurred to Dr. Jamefon on the two preceding Tables.

That during the space of twenty years, the number of annual deaths was very similar, varying very little in any year, or in any month of these years. And as it appears no uncommon incident occurred during that time to alter the natural order, we have a tolerable certain estimate, which may be said to be 203 annual deaths out of 2400 pensioners.

That these men who were mostly in advanced years died in greatest number in the three winter months, reckoning December the first; and in the smallest proportion, in the three summer months, reckoning June the first, and that the spring was more mortal than autumn.

Viz. From November till March 1146.

— June 1087.

— Sept. 886.

— Dec. 924.

TABLE OF THE DIET AT GREENWICH HOSPITAL.

Days.	Bread. lb.	Beer. quarts.	Beef. lb.	Mutton. lb.	Butter. lb.	Cheese. lb.	Pease. p ^{ts}
Sunday	1	2	—	1	—	$\frac{1}{4}$	—
Monday	1	2	1	—	—	$\frac{1}{4}$	—
Tuesday	1	2	—	1	—	$\frac{1}{4}$	—
Wednesday	1	2	—	—	$\frac{1}{16}$	$\frac{1}{2}$	$\frac{1}{2}$
Thursday	1	2	1	—	—	$\frac{1}{4}$	—
Friday	1	2	—	—	$\frac{1}{16}$	$\frac{1}{2}$	$\frac{1}{2}$
Saturday	1	2	1	—	—	$\frac{1}{4}$	—
Total per week.	7	14	3	2	$\frac{2}{16}$	$2\frac{1}{2}$	1

Broth is made of the meat.

The diet of the sick varies at the discretion of the physician.

It appears by the Table of Diet, that the allowance is well calculated for the purposes of health, and very much resembles the victualling of his Majesty's navy, two banian days in the week.—The proportions of animal and vegetable food are equally balanced.

THE END.