

"water-work, and that great part of our ancient houses in the city of London were built with it, and that it does well for table and other furniture."

As a candid quoter of Evelyn, however, I admit that he says, in another place, that he "cannot celebrate this tree for its sincerity; it being found (contrary to oak) it will make a fair show outwardly, when it is all decayed and rotten within; but that this is in some sort recompensed, for the beams have the property of being somewhat brittle, of crackling, and giving warning of danger."

To account for this drawback in Mr. Evelyn's opinion, it will be proper to observe, that this certainly is the case with old chestnut, that has been suffered to stand beyond the time of its attaining its full growth: it is then the worst of all timber, being more brittle and more apt to crack, and fly into splinters than any other; but I have never known this to be the case with young chestnut; and therefore, in point of economy, it should never be suffered to stand longer than the points of the branches, and the complexion of the bark, indicate it to be in a growing or healthy state; which is not very difficult to ascertain, by a person accustomed to make observations upon timber. And it is this very circumstance, when properly attended to, that makes this timber more profitable than most others; for it is so early useful, that if it

be cut when it squares only six inches, it will be as durable as an oak of six times its size and age. This is in a great measure accounted for, by its having so little sap in proportion to other trees, as it will seldom exceed in thickness the breadth of the bark; whereas the sap of an oak will often be from an inch to two inches thick, which is not only useless, but, if suffered to remain, tends very much to the destruction of the timber: in other respects, the duration of the chestnut may be accounted for, from its being less affected by worms or insects, than other timber; otherwise it would be impossible that such roofs as King's College, Cambridge, built in the reign of Henry VI. with chestnut, and many other equally ancient buildings, should have lasted so long, and be still in a perfect state, as many of them are.

Therefore, like Mr. Majendie, I earnestly wish to see the culture of this most valuable plant, extended over every part of the kingdom, as it must prove highly beneficial to the public.

But let no one be afraid of cutting it too young; for, let this tree be ever so small, if it is large enough for the purpose for which it is wanted, it will be the less liable to decay, from its youth; and, if underwood be the object, the proverb in beech countries, will be fully verified, "Cut wood and have wood."

## ON THE CULTIVATION OF LAND WITH POTATOES.

BY SAMUEL DUNN, ESQ.

From the Same.

I Readily comply with the wish of the Society, that I would inform them of the quantity and value of the wheat which grew upon the acre and a half of land that I had with potatoes in the spring of 1790.

\* In the ninth volume of these Transactions, page 38 to 44, is inserted an account given by Samuel Dunn, Esq. of an experiment made on one acre and a half of land which was cultivated by him with potatoes, instead of lying under a summer fallow; and the Society having this year received the above account from Mr. Dunn, stating the advantages resulting from that practice, the silver medal was voted to him for their communications.

instead of having a summer fallow to kill weeds and quick grass, as I had been advised to do; and which wheat was sown on that same land from whence the potatoes were taken in the month of October following, with only one ploughing, and no fresh manure.

The account will, I doubt not, be very pleasing to the Society, as well because of its extraordinary value, as that it will further prove how beneficial the growth of potatoes is, and the easiest and most advantageous way of bringing land into order, when filled with noxious weeds, as mine was.

The wheat has been all threshed out, and measured under my own inspection, and produced eight quarters and a half of clean corn.

£. s. d.

Six quarters, sold for seed, at 44s. — — 13 4 0

Two quarters and a half more, not sold, 14 bushels of which we kept for our own seed (the price of wheat is fallen): therefore say, at 41s. — — 5 2 6

Hinder ends from ditto, 2 bushels, at 3s. — — 0 6 0

Straw from ditto, 16 threave, at 1s. 6d. — — 1 4 0

Short straw from do. worth — — 0 5 0

20 1 6

Expences attending the growth of the wheat, &c.

£. s. d.

Ploughing an acre and a half of land — — 0 5 3

Paid for seed — — — 1 6 6  
Sowing and harrowing — — — 0 4 0  
Weeding — — — 0 2 8

A boy to guard the wheat from the birds, 30 days, at 4d. — — — 0 10 0

Reaping the corn, being very thick grown and strong corn, two men, two days, at 2s. — — 0 8 0

Waggons, horses, and men, to bring it home — — 0 4 9

Threshing 15 days in harvest time, at 2s. — — 1 10 0

Dressing the corn — — 0 2 3

Rent for one year, at 20s. per acre, being the most it has been let for, tho' worth more — — 1 10 0

Taxes on ditto, about — — 0 3 10

Total — £6 7 3

This sum, deducted from the total value as above, leaves 13l. 14s. 3d. clear profit, the rent and taxes being accounted for.

I must beg leave further to observe to the Society, that this experiment of mine, made in some degree under their sanction, will appear to have completely answered the end proposed: the land is freed from the weeds and the quick grass, with which it was over-run; the owner of it is very much benefited, in point of profit; and the country farmer convinced at least, if not informed, that this method of tillage may very prudently be practised in future.

## AN ESSAY ON GENIUS.

THE perception of relations, which is all that is meant by philosophy, is of infinite importance in regulating the heart and conducting the affairs of life. Some truths are obvious, and cannot but be perceived, while others are attended with difficulties, which it requires the utmost efforts of the understanding to remove. Relations are not always immediately perceivable, even where there is a perception of the objects; but argumentation and long and tedious deductions are sometimes necessary. Many truths were unknown to the ancients with which the moderns are thoroughly acquainted, and by

the ingenuity of the human mind, discoveries are still made, and new relations and connections will be continually opening upon us, till the course of nature shall be exhausted. How these discoveries are made, and what it is in the mind, which perceives them, and how that something, which is commonly called genius, is affected by external circumstances, is the subject of the present enquiry.

It is the observation of a judicious author, "that oratory has nothing to do with the discovery of truth." In a disquisition, therefore, of this kind, we must entreat your indulgence, though we shall not amuse you with the flowers of rhetoric, or solicit your attentions by the delicacy and harmony of language.

In order to discuss this subject, we must examine a little the nature of the mind and the origin of our ideas. When we speak of the mind, I mean that which perceives and chooses, and not that which has, as some express it, a power, capacity, or principle of action which it never exercises. For a power, which is never exerted, is an incomprehensible power.

Nothing can be the immediate object of the mind but ideas. By ideas we mean nothing but perceptions; and these perceptions are always clear and distinct, in a compound ratio, of the simplicity of the relations, and the aptness of the perceptive organs to communicate the impressions of external objects. The origin, therefore, of all our ideas must be from without.

But here, perhaps, it may be said, that some of our ideas are obtained by reflection. We grant it—but what is meant by reflection? It doubtless means a perception of the agreement or disagreement of ideas, which are already in the mind; and it is needless to observe that the relation between two ideas cannot be perceived, before the ideas themselves are obtained. Hence we may safely conclude,

that sensation is the primary medium, by which we obtain our ideas.

All knowledge consists in discovering the relations of these ideas; and the particular objects which are at first presented to the mind have a powerful influence in directing it to the discovery of particular relations. And as genius, in general, consists in a perception of relations, a facility in discovering those of a distinct branch is that which constitutes a particular genius.

There is a great variety in nations, and in individuals, for which perhaps a few observations will be sufficient to account. For upon examination we shall find it abundantly evident, that it does not depend upon any original defect, or upon any difference in the contexture, or qualities of the mind. Much less than men in general are willing to allow, should in this instance, be attributed to the energy of nature. We need only advert to the effects of climate, laws, manners, and religions, to obtain a satisfactory account of all the varieties of national genius.

In almost every country there is a particular turn of thought which is characteristic, and is called the prevailing genius of the nation. Thus we find all the varieties among nations, that are to be found amongst individuals of the same nation. In accounting for this variety, something it must be allowed, depends upon the constitution of the body. In cold countries, it is observed by naturalists, that the body acquires a greater degree of firmness and vigour, than in the warmer climates. The fibres are contracted by the cold, and thence derive an additional elasticity and force. This might afford us a clue, which, if we had time to pursue it, would lead us to the discovery of many important mysteries in the system of intellectual nature. The body is always more or less affected by the exercises of the mind. This

is apparent, from the effects of study upon slender and delicate constitutions; for it is not the immaterial, but the material part, that is worn out and relaxed by attentions. Here then is the true cause of the superior courage, stability, and perseverance of the northern nations, and, in a great degree, of their improvements in philosophy and the arts of government. The constitution of the body, as it is affected by the climate, is not, however, the only, nor perhaps the principal cause of the diversity of national genius. There is such a connection between the mechanic and the liberal arts, that they always go hand in hand in their improvement. And though they may in some measure be mutual assistants, the latter, especially in the early stages of society, should be considered rather as the consequence of the former. We can hardly expect to find a knowledge of the sciences, and any considerable improvements in the art of government, where there is not a knowledge of agriculture and the useful arts. Nor can the useful arts obtain any tolerable degree of perfection, and not at the same time effect a revolution in the genius and disposition of the mind.

The invention of useful arts is owing to necessity. In warm climates the means of subsistence are easily obtained; the soil is fertile, and the spontaneous productions of the earth are nearly sufficient to support its inhabitants. They have little or no need of clothing and habitations, the invention and procuring of which employ much of the attention of the northern nations. The spur to industry is therefore wanting, and habitual indolence is the effect of constant plenty. Thus in warm and fertile countries the mind contracts a superficial and cursory habit of thinking; and spends that time, which it knows not how otherwise

to employ, in poetic raptures, and the illusions and dreams of fancy.

In colder and less fertile countries, the mind, in order to procure the necessaries and conveniences of life, is early engaged in the invention of arts, and the body inured to labour. Lands must be cultivated—houses must be built—clothing, and utensils must be fabricated; these require the continual attention, and excite the inventive powers of the inhabitants. From an early habit of industry, exercise ceases to be a toil, and the intense application of the mind becomes a pleasing and necessary employment. For when once the mind has acquired a habit of application, it will not easily be satisfied with a superficial wandering from object to object—it loses that versatility which accompanies indolence, and acquires a capacity of investigating every subject, with which its interest is at all connected. And where ever the soil of the country is not so barren as to require the immediate and continual attention of all its inhabitants, the intervals will be spent in the invention of arts—in facilitating labour—and in regulating the affairs of society. Perplexities and difficulties arise in societies in proportion to the advancement of agriculture. A division of property ensues—quarrels and disputes arise, which require the decisions of prudence—and at length the important discovery is made, that the interest of each individual is intimately connected with the security and unanimity of the whole society. In this train of improvement man is led to the discovery of philosophy and politics, which flourish only in cultivated countries.

It may also be observed, that from this habit of attention their sensations respect a less variety of general objects, and their perceptions, especially of sensible ideas, are accompanied with less considerable

siderable degrees of pleasure and pain. As their pleasures and pains are less acute, they can attend longer to the same ideas, examined them on every side, and discover their most remote and obscure relations. For these reasons civilization and the improvement of the mind have been chiefly confined within the boundaries of the temperate climates.

In countries, where little or no cultivation of land is necessary, and in others, where the produce is not sufficient to repay the expence, there is no division of property—their laws are few, and their civil policy such, as requires the least possible exertion of the mental faculties. This, without any resource to a native defect of the understanding, is sufficient to account for the stupidity, and savage state of the inhabitants of Africa.—And, from the uniformity of causes and effects, as it ever has, so we have every reason to believe, that it ever will debar them from the knowledge of arts and the conveniences of civilization.

Should Egypt or the States of Barbary be produced as an exception; my answer is ready. Their subsistence depends upon exercise and labour. The regulation of the Nile was formerly an object of the highest attention, and by employing the invention of the inhabitants, produced the same effects upon the mind, as the common method of cultivation in the southern parts of Europe and Asia. For this reason perhaps, rather than on account of its fructiferous qualities, the Nile obtained divine honours from the Egyptians, and with as much propriety as Ceres, Hermes, or Bacchus, did from their Grecian votaries. The small degree of civilization, which has at any time obtained among the States of Barbary, may justly be attributed to their extraction, their proximity to the ocean, and a necessity of obtaining a part of their subsistence from

that dangerous and troublesome element.

The sterility of the most northern regions, produces the same effects with respect to civilization as the too great fertility of the south. Nothing or very little, can be obtained from the soil; fishing and hunting afford the only means of a subsistence. The inhabitants are therefore, destitute of property—have leisure to attend to nothing but the implements of their occupations—and by their utmost efforts are scarcely able to supply the present necessities of nature. Thus we find it is the united testimony of reason and experience, that much, very much is effected by habits, occasioned by the climate and the nature of the soil.

The influence of laws, religion, and manners, in assisting or retarding the progress of knowledge, is very extensive; but as those are also greatly affected by the climate, I shall only remark, that those laws, which afford the greatest security; that religion which is the most benevolent; and those manners, which are the most open and ingenious, are the best adapted to improve the mind and form a regular and happy genius.

Having accounted, upon general principles, for the variety of national genius, I shall now make a few remarks upon that of individuals.—Nations, with respect to the whole globe, are as individuals with respect to a nation; and the same causes which produce a national difference, have likewise their effects upon individuals. But as the effects are more particular and limited, so are likewise the causes for even a defect in the sensitive organs, which may be occasioned in a variety of ways, either by the operation of nature, the carelessness of others, or by a person's own misconduct, may deprive him of a particular kind of perceptions; and of the ideas, which are not perceived, he cannot dis-

cover

cover the relations. This however, is not a defect in the mind, but in the arrangement of the organic particles. Hence it follows, that originally each individual may not only be capable of equal improvements, but may be capable of succeeding equally in the discovery of all kinds of relations. And that some excel in one branch and some in another may doubtless be imputed to particular impressions and habits. The discovery of truth affords a natural pleasure to the mind; and whatever ideas are at first presented, and whatever relations are at first discovered, have a natural effect in prepossessing the mind in favour of such discoveries. For so much depends upon the ideas, with which we are at first acquainted, that in this way a genius, or an aptness to discover a particular kind of relations, may easily be formed.

We can easily conceive of a poet or a philosopher, a mathematician or a painter, whose particular genius is owing to no other cause than the one I have mentioned. In some instances, we know, that it is in fact the case, and in others it may be equally true, though not so easily discerned.

The soul is an active principle, and is ever ready to receive impressions through the medium of the senses. Perhaps it will not be amiss to compare it to a pool or cistern of water. Water is a fluid that presses equally in every direction; and though it presses equally on every side of the cistern, it cannot be said, that it tends to any one point in particular. Whenever a passage is opened, through which but a small part of the fluid can escape, every particle in the cistern is immediately directed towards that point; and the longer the water continues to flow out in that direction, the more force will be collected, till it becomes as great as the quantity and situation of the fluid are capable of producing. Thus it is with the mind. The force of a

single perception may turn it into a particular direction. And by pursuing a particular train of relations, the mind flows on in the discovery of such relations, with as much ease and rapidity, as a stream in a channel to which it has been long accustomed.

Other causes, besides those which we have mentioned, may have their weight; but, in general, all the diversity of genius must be ascribed to early impressions, habits, and exercises. Geniuses are not original, but acquired; and all that is meant by an original genius is only an acquired habit of thinking, which is a little removed from the common road. Thus every person, with the assistance of those about him, may be considered as the author of his own genius. If what has been advanced be false, let it be rejected; for truth is the diadem of heaven; and whatever is established upon the immovable basis of experience, however it may differ from those systems which are common, ought ever to meet with a cordial acceptance. What but an attachment to systems, and a deep rooted prejudice, that there is an original difference in the minds of men, has hindered thousands from using their advantages and adventuring in the paths of science? What but this has deprived one half, and perhaps the better half, of our species of the means of knowledge? They are early habituated to think, that this is an attainment beyond the extent of their abilities. This is an insufferable barrier, and sufficient to account for the effect. But there is nothing in nature, which says to any individual, "here shall be the limits of thy improvement." And may we not flatter ourselves, that the time will come, when these prejudices shall be removed—when we shall all be united in advancing the common interests of knowledge and happiness! This may be considered by some as a chimerical expectation; but it is founded



founded upon the present flattering appearance of the civilized world.— And whoever shall contribute to the establishment of such a revolution, a revolution productive of the

most salutary effects in the intellectual system, will be more deserving than those who have conquered nations and laid the foundation of empires.

## OF THE ANTIQUITIES NEAR NAPLES.

BY CAPT. SUTHERLAND.

WE lost no time in seeing the wonders of this extraordinary country. Our first object was to follow Æneas to the Cumæan shore; and on our way thither, it was but just to pay our oblations at Virgil's tomb. This celebrated monument is close to the top of the grotto of Pausilippe, on the left of the eastern entrance. The inside is a square of twelve feet, with three niches for urns on the east and west sides, two niches and a door, through which you enter, on the south, and the same on the north. The roof is arched, and about nine feet high. The outside was originally octagonal: but, the angles being worn away, it is now circular, and, at a distance, looks like the remains of a small tower. The materials are of the common kind, and I did not observe any marble near it, except two modern inscriptions.

Formerly, the tomb was surrounded with laurels, but as every idle visitor took a leaf, there is not a sprig left. We could not help exclaiming against such sacrilege; but our Cicerone endeavoured to comfort us, by saying that the Marquis Salicrò had ordered a new set to be planted.

The grotto of Pausilippe is at the west end of the suburbs of Naples. It is a public road cut through the mountain, near half a mile in length, and wide enough for two carriages to drive abreast. Its height is very irregular, in some parts eighty feet, and at others only five-and-twenty. In the day-time, you may see from one end to the other, by the help of two large apertures, cut diagonally from the center of the grotto to the

surface of the mount; but, at night, we were obliged to use torches, which, when any number of vehicles are driving together, have a most beautiful effect. The bottom, like all Naples, is paved with square pieces of lava. Its exact date has not been ascertained. The common people insist that it was done by enchantment; as a proof of which they alledge, that no stones were found near the entrance. It would be to no purpose to tell them, that those who perforated the mount, very naturally made use of the stone in building the town.

But after all, the difficulty in accomplishing this passage was by no means so great as one would at first imagine; for the stone is so soft, that until it has been for some time exposed to the air, you may crumble it to dust. Neither, in my opinion, is this celebrated excavation equal to the batteries, magazines, and communications, formed in the solid rock of Gibraltar by Mr. Incheval, under the direction of General Eliott, and continued with astonishing success by Major General O'Hara.

After passing the grotto, we drove to Puzzoli. The road is remarkably pleasant, great part of it running between groves of poplars, planted in regular order, to sustain the vines in the style of our hop-gardens. The vines are loaded with grapes, and encircling the trees, form a variety of beautiful festoons from one tree to another, in every direction. The ground beneath is either covered with grass, or laid out for corn.

Turning a little out of the way to the right, we came to Lago D'Agnano, formerly a volcano, now a romantic,

romantic, beautiful lake. Close to it, is a little cave called Grotto del Cane, from a vapour that rises in it so obnoxious to dogs, that it kills them in a few minutes; and doubtless it would have the same effect on man, or on any other animal, whose head was held near the ground.

Between Lago D'Agnano and Puzzoli, on the side of another extinguished volcano, called the Solfaterra, we saw the Piscatelli, or boiling springs, of whose wonderful effect, in turning lava and pumice stone into clay and into soil, I had, the same evening, the satisfaction of hearing a philosophical account from Sir William Hamilton, with which he has already favoured the public.

We hired a boat at Puzzoli; and, after rowing about two miles across part of the celebrated Bay of Baia, with Virgil in my pocket, landed close to the Lucrine Lake, at the foot of Monte Nuovo. This mountain, which is several hundred yards in height, and above a mile in circumference, was thrown up by the Lucrine Lake in a violent earthquake in the year 1538. However strange this may appear, such phenomena are by no means uncommon in Italy. The lake was of course much reduced by this eruption, and now only covers three or four acres. It is about ten yards from the sea, and has a sluice to communicate with it.

After a short walk in a pleasant vineyard, we entered the Sibyl's Cave, a road cut through a mountain in the style of the grotto of Pausilippe, but on a smaller scale. The passage from the cave to her palace is only wide enough for one person. After descending ten or twelve yards, we came to her baths, four small chambers with water still in them. We were carried through on men's backs, with candles in our hands, and ascending a little on the opposite side, came to the door of her palace; but it was so choked up with rubbish, that we were obliged to return without finding

an entrance; and passing through her cave and a wild shrubbery on the west of it, we arrived at Lake Avernus, and on the opposite banks, saw the grove where Æneas was to find the golden bough.

The lake seems to have lost the noxious qualities which Virgil ascribed to it; but this, I imagine, is owing to most of the high trees, with which it was closely surrounded, being cut down, and little but brushwood left. The temple is at a small distance on the right of the lake; we wished to go to it, but our Cicerone persuaded us that it would be better to delay seeing that and the entrance into hell, until we had been at Cumæ.

We therefore repassed the Sibyl's Cave, and returning to the Lucrine Lake, again embarked, and proceeded along the shore to the foot of Nero's palace, where the sand under the sea water is so hot, that we could scarcely touch it:—The effect of subterraneous fire.

The baths are above. These are several large chambers, divided into different apartments for the men and women, with two subterranean passages leading to the water, which unite at the distance of two hundred yards from the spring. Here the heat is so excessive and insupportable, that it is supposed no longer necessary to continue the separate passages, since even should persons of different sexes advance thus far, there is no danger of their being noticed by each other, for to get here cost us great pain; and all our clothes, in a few seconds, were wet through with perspiration.

This is what they call bathing, for nobody can bear the water. One of our guides, for a pecuniary reward, brought a little in a bucket, and boiled some eggs in it, which were afterwards served at our table in a shady spot on the adjoining classic ground; and we crowned this grateful repast with the health of a favourite fair, in a smiling bumper of real Falernian, from the very vineyards