CHEESE-COLOURING.

AN ESSAY,

SHOWING

THE INUTILITY AND MISCHIEF
OF THE PRACTICE,

AND

ADVISING ITS DISUSE IN THE DAIRY;

ADDRESSED FIRST TO THE CONSUMERS, AND THEN TO THE
MAKERS OF CHEESE.

BY

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OF LONDON.

LONDON:
JAMES RIDGWAY, 169, PICCADILLY.
1841.
TO

GEORGE WILBRAHAM, ESQ., M. P.,

Whose unwearied efforts for the improvement of Agriculture have ever formed so conspicuous a trait of character, the following "Essay" on the use of Annatto in Cheese-making, (with every wish that he may continue long to live, the general philanthropist, in the hearts of a grateful tenantry, the kind and benevolent Landlord, the poor man's friend, and the zealous promoter of the advancement of good husbandry; and in the enjoyment of health and happiness,) is most respectfully addressed by his very obliged and obedient servant,

GEORGE WHITLEY.

Stretton,
May 26, 1841.
PREFACE.

It being requisite as well as customary for the author, however small his work, to offer to the public some explanation of its nature, and his reasons for undertaking it, as well as certain elucidations of some parts or passages therein, by way of introduction to the general reader, I beg leave to follow the beaten track, as the safest, in presenting the following Essay on the use of colouring in the making of cheese.

The county of Chester being my native place, and a part of it the sphere in which I have had extensive practice as a surgeon for a number of years, and many of the
families of my patients being engaged in the pursuits of agriculture, I had thus frequent occasions afforded to me for observation; to whom and all others of my friends, I now tender this acknowledgment of gratitude for their steady confidence during my successful career. My natural bent of mind having been favourable to the contemplation of whatever might be connected with the art of husbandry, will, I trust, form also some reason for having undertaken a subject which may possibly by some be considered not quite professional.

But, before proceeding farther, I beg to state, it is to my honoured friend, George Wilbraham, Esq., M.P., that much praise will be due for having been the first promoter of this inquiry, and for whatever good may arise out of it to the country, he having, in his address as Chairman at the anniversary meeting of the South Cheshire
Agricultural Society, held at Northwich, 24th September, 1840, earnestly pressed it upon the public attention. This worthy gentleman, in a very judicious letter to the secretary of the Society, published in the Chester Courant, 17th November of the same year, still farther urged it into notice by many sensible remarks on the evil consequences arising out of the use of colouring, such as the deterioration of the quality of cheese, and the waste of the farmer's money in purchase of it for worse than useless purposes, &c.

Mr. Wilbraham having, on both the occasions before alluded to, very anxiously sought for a treatise, with the view of giving general instruction on the subject, and endeavouring to persuade all, both consumers and makers of cheese, from the use of colouring; and having myself long thought Annatto (at least) useless, though I confess, like other people generally, I had
given its composition little consideration, supposing it to be a simple vegetable extract of foreign production, and being not aware of its evil and disgusting adulteration, till my attention was thus called to it—these are some of the reasons for undertaking this work; and as Mr. Wilbraham in his letter had given intimations as to the order in which he could wish the subject to be treated, as I progressed, finding it was well arranged, I have, as near as may be, adopted it.

And first—as on the commencement of any colouring being used, the Annatto of South America only was believed to have been applied unadulterated, I have begun with the botanical history of the tree Bixa Orellana, from which it is formed, described its mode of preparation, its medical properties and other powers, supporting them by several good authorities.
Secondly, I have alluded to it as an article of commerce, and given, as near as could be obtained, or may be of any use, the quantity imported. The reader’s attention will naturally be called to the great disproportion between that of Liverpool and Bristol; the contiguity of Liverpool to the great districts for printing and dyeing, having been the probable cause, will be some evidence that Spanish Annatto is chiefly consumed by them, and, comparatively, but little by the dairy.

Thirdly, it being too evident to admit of any doubt that the colourings, for they are numerous, which are now in use, are entirely of an adulterated nature; I have supplied several Receipts for the information of the Public, and trust sufficiently made out, in the after-part of the writing, that their contents are an interruption to
the various stages, in the making, ripening, and decay of cheese, and are greatly preventive of its otherwise high qualities.

It may perhaps be thought by some I have asserted too much for the effects of Annatto, both real and fictitious, when mixed with the various component parts of cheese in the process of making it; against which opinion I must state to all, that cheese-making is purely a chemical operation; I must remind them, how much results are changed in many of the other arts, by the introduction of the slightest variety of matter from what is ordinary or otherwise, and then, as coming nearer home to this business, request them to pause for one moment to reflect how small a portion of rennet will coagulate the largest tub of milk.

Perfection being unattainable in any
human undertaking, and having had little time for an inquiry, before unattempted, and consequently, no experience of any predecessor to assist me in throwing light upon what is so obscured by a confusion of unkindred ingredients, as to render it incapable of that experiment which would give results sufficiently speedy and satisfactory, to influence immediate application in practice; I have taken as my guides past experience, and reason founded on established theory, relying on their being sufficiently clear and conclusive to support my positions, rather than, by waiting for the results of a repetition of experiments create further delay.

As it is most desirable another year shall not pass over without an effort being made to inform, in order to persuade, the Public on this important subject, I therefore beg to lay it now before them, relying
on a charitable judgment, and acknowledging deficiencies in the work, which, I hope, through more time and greater ability, may be supplied.
AN ESSAY,

Bixa is a genus of the Monogynia order, and Polyandria class of plants, ranking under the 37th order Columniferae of Linnaeus; natural order Tiliaceae, or rather allied to the order Tiliaceae of Jussieu; corolla ten-petaled; calyx quinquelobed; capsule hispid and bivalved. It is of a ligneous texture, grows with an upright stem to the height of eight or ten feet, sending out many branches with elm-shaped, pointed leaves, having long footstalks. The flowers are produced in loose panicles at the ends of the branches, and are of a pale peach colour; petals large, with numerous bristly stamina of the same
colour in the centre. After the flowering is past, the germens become mitre-shaped vessels, covered outwardly with bristles, somewhat like the hedgehog; and (when ripe) gape with two valves each, discovering within a number of seeds, in form very like those of the grape, of a reddish colour. The seeds are surrounded by a red waxen pulp, from which the colouring matter of commerce, Annatto Orellana, is prepared.

The Bixa tree is a native of South America, but is now cultivated in some of the West India islands, and may be propagated here in a hot-house, and kept in the stove. It bears leaves all the year, its fruit in the spring, when it is gathered. Of this genus there is but one species known, and which will engage my present attention, called "Bixa Orellana;" it may not be altogether uninteresting, therefore, if I attempt to trace the origin of its name, as it may lead to the date not far distant from the time some knowledge of the tree was first communicated to this country.
And although I can find no direct intimation given by any preceding writer to assist me, several other circumstances unite to lead me to the conclusion, that the name “Orellana” was added to it by Linnaeus; a custom of his to distinguish the species of plants, and who took this opportunity of doing honour to the name of Francis Orellana, for his eminence as a traveller in the country to which Bixa is indigenous, or as its discoverer. About the year 1540, Francis Orellana first traversed Amazonia, and after this, but how soon does not appear, the river Amazon was called Orellana. The pulp of the Bixa being called Annatto Orellana, and by some Terra Orellana, on the erroneous supposition of its being an earthy production, it is but a fair inference that “Orellana” in all these instances may be applied to this Spanish officer, who very probably about this period made known the tree to this country, and which it appears was imported to us by the Earl of Portland, 150 years ago. If this be
correct, the Bixa, if not the inspissated pulp, may have been no secret here for nearly 300 years; although, from information in which I can confide, by many old persons, I feel convinced that, as a dye for cheese, its use has been in some degree general only one hundred years.

Anatto has, till of late years, been chiefly prepared by the Spaniards, hence called Spanish Anatto, and, allowing some slight variations, after the following manner:—the bristly pods containing the seeds and red pulp are infused in hot water, and stirred about; when the colouring matter has subsided, the water is poured off, and the pulp, being sufficiently dried in the shade in shallow vessels, is moulded into various shapes for exportation.

Many writers have spoken on the properties of Bixa, but one or two may be sufficient proofs to bring forward; and the first in point of time is Francis Hernandez, whose observations on the productions of Spanish America were published in 1651,
under the title "Nova Plantarum, Animalium, &c. Historia." After having described the various names and parts of the tree and fruit, he says much of the uses of the wood, and of a pigment, meaning of course Annatto, explaining its formation similarly to the description just before given; and then, as having the most reference to the subject here to be treated, says, "It is so tenacious, that when applied it can scarcely be obliterated, and if mixed with urine it is indelible; it yields a red colour for painters, possesses a dryness and astringency, assists in dysentery, and restrains the belly flux."

Miller, in his Gardening Dictionary, says little more worthy of remark, but that it is found in South America and several of our West India islands; the colouring matter is extracted from the pulp which covers the seeds, and that it is used by the natives medicinally, in the bloody flux and in disorders of the kidneys.

Dr. Hooper’s Medical Dictionary of 1802
says Orellana Terra, in Jamaica and other warm climates, is considered an useful remedy in dysentery, and is astringent and stomachic.

Annatto is of considerable importance as an article of commerce, is extensively used by printers and dyers of silk and cotton, to which it gives a deep orange and buff colour. They use it generally for imparting tinges to different colours, for which purposes it has been long in use, but is, when thus applied, of a fugitive nature.

Of how great importance is it then, that no portion of a drug so much required by the arts should be swallowed up for useless purposes, but rather be therein retained to aid, however little, in keeping down the price of apparel, for the good of the public and encouragement of trade!

The importation of Annatto entered for home consumption, on an average of the three years preceding 1832, was, speaking in round numbers, 57 tons; and, in the
year 1840, into London, 74 tons; into Liverpool, 160 tons; and into Bristol, 11 tons.

My informant of the Liverpool Import, says, nineteen-twentieths of the Annatto brought there, are consumed in printing and dyeing. And in the absence of positive information on the same point from London, Bristol, and other places, where there are extensive private manufacturers of an adulterated Annatto, or cheese-colouring, (on which I shall treat more largely hereafter,) who, feeling it their interest to hold secrecy, think the inquirer highly inquisitive, and will render no account; I say, in the failure of this, it may be justifiable to conclude that about a similar proportion of what is imported into all other places, is bought up for the use of the dyers, as was the statement from Liverpool. One-twentieth part only, then, of genuine Annatto, is turned to some other account; and since, as far as we know, the whole quantity imported, resolves itself
into the two distinct uses of dying and colouring of cheese, it must be for the latter purpose. But this bears very little proportion to the great quantity of colouring matter used in all the British dairies of cheese, and for the colouring of butter, for which it is extensively consumed in many places, as Yorkshire, Lancashire, and now by some dairies on the continent. That eminent physician, Dr. Holland, in "the "Survey of Cheshire," told us above thirty years ago, that 5 or 6000l., were paid out of the pockets of the farmers annually, for cheese-colouring in that county; and we know that the requirement of the same in the county of Gloucester, from its extent of land, and proportion made use of there, (which is about half an ounce to each half-hundred weight of cheese, being at least double the quantity of what is put into each Cheshire cheese of equal bulk,) cannot be less than 10 or 12,000l., two very strong cases to prove that the amount of colouring, Annatto and money, so misspent in
all places, must indeed be considerable every year.

A question naturally arises, whence comes the other portion of colouring ingredient for cheese and butter? and of what is it composed? as it cannot be Spanish Annatto, since, upon a very superficial calculation, it is too apparent to need entering upon an investigation of more exact quantities, as respects the colouring and sums of money expended for it, which some might have been better satisfied to have had presented to them, and I should to have laid before them, if the secrecy before alluded to, of the trade which compounds the deficiency, had not withheld the necessary information. But had this been communicated, it would have supplied no new information beyond the mere amounts, to corroborate the evidence already too clear to be disputed, how great a quantity of Annatto, by the disuse of it as a colouring in the dairy, would be diverted into the hands of the dyers, and tend to a reduc-
tion of its price in the market; and how much money, by a resolve on the part of the whole body of farmers, to use neither that nor colouring of any description, would be left in their pockets, for the better purposes of laying it out in that highly concentrated manure, bone-waste, or other general improvement of the land; whilst by the same resolve the quality, if not the quantity, of both butter and cheese, might be benefited.

This leads me to the chief object of inquiry for which I set out, to treat on the use or necessity of Annatto, or indeed any other dye, as an ingredient of cheese; and I hope to prove that it is not only neither useful nor ornamental, (for well-made cheese has its own natural tint, not surpassed by any other artificial paints, and is like every other beauty, when unadorned, adorned the most;) but that the colourings which are and ever have been in use, are an obstacle to the process of making, and to the natural changes required in the
maturation of cheese, which is on that account prevented arriving at the perfection it might attain, without their introduction. I trust it will be made to appear that all the dyes now applied in the dairy, are adulterated compositions, and though not poisons, as far as appears by the receipts I have been permitted to obtain, are very likely to render the cheese which contains them, harder, in every respect deteriorated, and more unwholesome.

If an artificial colouring was really needful to form good cheese, it had been well if the old custom had been adhered to, of using the simple vegetable dyes of turmeric, carrots, and marigolds, which would have done but little harm to the cheese, and rendered deception more difficult. Or had the pure Annatto Orellana, which is another unmixed vegetable product, been strictly retained, little worse effects might have resulted than from the other before-mentioned primitive colourings. But almost as soon as Annatto was
introduced generally, the price became so high as to tempt men devoid of principle, of whom there is seldom much lack where gain is in prospect, to form an artificial compound, which (through the influence of bad example, and a necessity of self-defence in the market) speedily induced so many others to follow the example, that now manufacturers of it are established in almost every large town.

The Formulae are numerous, and of various component parts, some containing a bit of genuine Annatto, perhaps for conscience sake, whilst other makers, who have no consciences at all, may have left it out altogether, selecting other ingredients, such as by their skill they were enabled to form the nearest resemblance at the least possible cost to themselves. The consumers consequently have been, and are now paying most unreasonably for the counterfeit, to the extent, at the present time, that whilst the pure Annatto costs little more than one shilling a pound as the market-
price, the makers of cheese-colouring are selling it at from 4s. to 4s. 6d. per pound. The cheese factors, in many instances, making the sale of colouring a branch of their trade, then make the last turn of the screw upon the pockets of the honest husbandmen, by retailing to them a fictitious article, which contains, generally, very little of the true Annatto, at 6s. 6d. and 7s. per pound, and which can be, and very probably is often, made without any. I have specimens, which I have got prepared, that are sufficiently undistinguishable from those in daily use. Thus, it is but too manifest, becomes exposed one of the many oppressions quietly submitted to by the industrious agriculturists; who, as a body, are in general too passive through much of the business of life; and would, rather than bestir themselves into an union for self-protection, go on till doomsday in the old jog-trot way, thus "tricked and rarely thriving." As an example of this supineness, they are evidently patient dupes of
the venders of colouring; tolerating, without inquiry, the use of almost innumerable adulterations of it, none of which differ in any important degree from the following five receipts; according to which, I have undeniable evidence to testify that the cheese-colourings used in Cheshire and Lancashire, and probably all other places, are prepared, for I have gained possession of them, though, as I anticipated, with no little difficulty. The proportions in the receipts I have not entered, because they vary with each manufacturer, are not essential to be known, and most desirable to be hence discontinued in practice.

Receipt, No. 1.
Take—Old Bricks, finely powdered,
Starch,
Turmeric Powder,
Spanish Anatto,
Train Oil.—Mix, to form a mass.

This was probably the nature of the first counterfeit colouring ever made, and
is of the oldest date I have met with any form of; but the brick-dust is too inconsistent for the present time, and most probably not now introduced.

**Receipt, No. 2.**
Take—Turmeric Powder,
Potash,
Spanish Annatto,
Soft Soap.—Mix, to form a mass.

**Receipt, No. 3.**
Take—Quick Lime,
Potash,
Spanish Annatto,
Train Oil.—Mix, to form a mass.

**Receipt, No. 4.**
Take—Quick Lime.
Potash,
Spanish Annatto,
Water.—Mix, to form a mass.

**Receipt, No. 5.**
Take—Quick Lime,
Potash,
Spanish Annatto,
Chalk, or, in lieu of it, Pipe-clay.
Water, or Train-oil.—Mix to form a mass.
In addition to the above, a friend of mine (on whom I can rely) informed me he had (by analysis) detected vermillion, which is a mixture of sulphur and quicksilver, in a cheese deeply-coloured! Admitting the general correctness of the before-statements, and if it be true, of which also I entertain no fears of disproof, that the pure Annatto of South America has never, except for a very short period on its having been first made known to this country, been used as a colouring for cheese; in confirmation of which Dr. Holland in the “Survey of Cheshire,” thirty-three years ago, declared that as soon as colouring became general in this country, a colour of an adulterated kind was exposed to sale in almost every shop. Then of course we have not, nor can have, any account handed down to us of the effects of real Annatto upon cheese during its use, neither have we any opportunity of observing them at present. We are therefore without any practical effects, and can
only be guided by theory; and although I am of opinion that most deeply-coloured substances, as reds and scarlets, according to the general law of materia medica, are astringents, and that all matter possessing this property, if mixed with the curd and other component parts in cheese-making, will tend more or less to interrupt one or more of those processes or changes through which all cheese must pass before maturation, but especially by its action upon the curd or animal gluten, which it will contract, condense, and harden, by that natural affinity or attraction which exists between gluten, gelatine, and tannin, the principle of astringency, as is strongly exemplified in the tanning of leather; to which the effects under consideration may be said to bear considerable resemblance in their nature, though differing in degree of power: still, perhaps Spanish Annatto is as little to be objected to as any thing that could be selected for effect, except the primitive dyes of
carrots and marigolds before mentioned, because free from all additions of an active chemical quality. But we are informed it contains the property of astringency, on the probable effects of which I have just spoken, and upon which the medicinal powers it has been granted to possess, by the high medical authorities, ancient and modern, before quoted, very greatly depend in those affections of the bowels they have admitted it to have efficacy to relieve, and this in a great degree, because they may be dependant on relaxation of the fibre as their chief cause.

It follows as a more than probable consequence, that the same astringing qualification of the Annatto Orellana, will likewise assist to produce that toughness and solidity too often met with, whilst it prevents the uniform mellowness which is an invariable condition in all dairies of high fame. I cannot, perhaps, in a more suitable part than this, state that there is another source from which this mischief
springs, which I have satisfied myself by experiment and observation, is more frequent than is generally thought of, and that is, the high temperature too commonly made the standard for putting the cheese together. But as this belongs more strictly to a treatise on cheese-making, I will only remark here, that the temperature of 100 degrees, fixed by some authors, is much too high. I have tried the temperature used by two celebrated dairy-maids in the month of May, the weather rather cold, and found it nearly the same in both, and at different times, that is between 72 and 75 degrees. In both these instances, the curd was formed alike, in about one hour. I would here beg to recommend all cheese-makers to ascertain what is the lowest degree of heat at which the milk in each particular dairy, by proper regulation of the warmth of the kitchen, &c., can be made to coagulate, in about the hour above stated, as worthy of imitation.

The astringency would also appear to
be at least one of the agents of destruction to the tendency to form *green mould*, a substance very rarely, if at all of a true nature, met with in coloured cheese; whilst, in that without colouring, it is the more abundant, imparting a flavour greatly approved of by many persons of refined taste. On these points I shall dwell more particularly, when describing the effects of the fictitious colourings. As regards the adulterated cheese-dyes, which I venture to assert are now and almost ever have been the only ones employed in the dairy, and with which alone, therefore, in this matter, we have to do, there is not the same reason for any doubtful observations as to their effects, as in the preceding case, because they are and have been long in use, and their practical results are still before us. They are made up of various ingredients of a chemical nature, apt in their tendencies to decomposition, to be changed themselves, and to form new compounds with other bodies when brought
into contact; and there being few articles in the Materia Medica of more active principles there are also very few that are not really deleterious in their effects, which could have been selected more offensive and objectionable for the purpose intended in the operation of cheese-making, which is a perfectly chemical process, and of a delicate and very interesting kind; and I apprehend, far more easily interrupted in its various stages than has ever been before observed. Whilst these facts are fresh before the mind, probably there is no part of this humble and imperfect attempt where I can more properly enter upon an examination of the component parts of the Receipts for the counterfeit colourings, with such remarks as I may be able to make on the prejudicial effects thereby produced in the various stages of the making, and upon the cheese afterwards; therefore, on referring to the Receipt, No. 1, it will be observed to contain brick-powder, which, though free from any
very active properties, it is not impossible but the operation of torrefying, or high degree of burning, may give to it a slight degree of astringency, an effect well known in some instances, the consequences of which I have explained in the observations describing the genuine Annatto. Besides this, its highly dried state will make it objectionable on account of its absorbent and hardening power upon the curd and cream. But surely no one will any longer hazard the swallowing of materials, if nothing worse, rendered by calcination so irritant to the stomach. The same Form also contains vegetable gelatine or starch, which, (though not soluble by the milk at the temperature the cheese is technically said to come; and on that account, the more likely to be suspended in the curd or animal gluten; and added thereto,) will, (though varying from it, and from animal jelly, in the less degree of tenacity it possesses), be apt to undergo the same changes with them, all of them being precipitated
by tannin, and thereby forming various degrees of insoluble substances, though the least so with vegetable gelatine. As this receipt, together with the astringency suspected in the brick-powder, receives as well some Spanish Annatto, (already admitted by high authority to hold the same principle,) these consequences may be calculated upon, and thus even the more simple or less concentrated gelatine of starch will, proportionally to its density, in all the stages of the cheese, add to the cause of that toughness of the caseous substance, and even hardness, often met with, especially in those cases where the farmers' wives are permitted to claim the butter to raise domestic supplies, a custom "more honoured in the breach than in the observance," whereby the old adage of "robbing Peter to clothe Paul," is too often verified to the letter. For should they have an unreasonable love of show and appearances, the milk will be so often sailed over by the "Skimmer," (thus com-
mitting a robbery of the cream and butter,) as to tend greatly to the diminution of the quantity, and what is worse, to the deterioration of the quality of the cheese. Turmeric, another ingredient, is a slight aromatic bitter, but has given place to more active medicines, and deserves to be considered here only as a dye. It is by the alkalies changed into a reddish brown, from its own natural yellow colour, and in this instance will have a deep tinge of red imparted to it by the addition of the Annatto. The whole is then made up with the most disagreeable of all the ingredients, train-oil, than which no other oil could have been selected so soon subjected to become rancid from its nature and mode of preparation. The oil will, from similarity, be most attracted by the cream, to which it will unite and communicate its offensive odour to the cheese in every stage.

The Receipt, No. 2, is composed of turmeric, potash, Spanish Annatto, and soft
soap. The general results of the turmeric and Annatto, have just been given, but the tinge of colour formed by the Annatto, will be peculiarly marked here by the action of the soap and potash upon it, and the turmeric, in producing a very dark red. Soft soap consists of potash, train oil, and tallow; its potash, with that contained herein, if it does not even attract, will be united to the cream and butter in the milk and cheese, and also to the tallow, and thus produce more saponaceous matter; the fish oil of the soap doing its part likewise in perfecting the ironical name of sweet soap.

Receipts, No. 3 and 4, like No. 2, hold in their general mass, potash, which, with the train oil, makes the coarsest kind, called black soap, and will, as before, taint the cream and butter. The Annatto, in all these forming a part, will continue to offer the power which has been by so high testimony declared to it, and thus do its work in the spoiling combination: whilst the
quick lime, which stands boldly at the head of both these caustical doses, comes to crown the whole; for, when united to the potash, which is here selected as a close companion in these discordant compounds, they form materials for one of the most active caustics used in the profession of surgery.

*Receipt, No 5,* (possessing the same active ingredients with No. 3 and 4,) will naturally produce the same effects, only the keen edge of the caustic will be somewhat blunted, (though I fear not through good intention,) by the knavery which has put so perfect a finish to the completion of its own character, and

"Still rising in a climax to the last,
Surpassing all is not to be surpassed,"

by the addition of chalk and pipe-clay, as makeweights against the too much already filched pockets of the consumers, both of which (though of so inactive properties
chemically and medicinally considered, as not to deserve much observation,) will be apt to dry and harden the caseous substance. Besides the afore-mentioned ill effects produced by the colouring ingredients introduced into cheese, it is more than probable, that as the rennet is a peculiar acid, the alkalies contained in these several formulæ, will in a degree neutralize it, and thus weaken its power of coagulation upon the gluten, or curd, by which means that quantity of curd, which ought to be got out, will not be obtained from the milk. And again, as the curd is soluble in strong alkalies, another diminution of it may in that way be effected, although the alkali be in a diluted state. Hence it follows that there will be a great loss in the amount of cheese everywhere made, for it is well known that after the caseous portion is taken away, as ordinarily practised, there remains in solution no very considerable quantity both of it and butter in the whey and butter-milk.
It is equally as probable that the ill scents and flavours so often met with, are produced by the offensive nature of the oils and the action of the chemical substances interfering with the fermentations, or those changes (at the several periods) which are requisite for the proper maturation of the cheese. And may not also the power of the alkalies to unite with the butter, in so doing, displace the butter from its general diffusion through the curd, and thereby allow of greater contraction, and cause toughness of it, whilst it prevents that mellowness which is a condition essential to all good cheese? Such are the nature and general effects, as far as the difficult character of this enquiry will permit, of as many of the compositions for the fictitious colourings as I have been able to gain possession. But I feel quite as well satisfied, there are others of no more desirable contents to be mingled with an important article of our daily food, which the manufacturers will not give up, but
which it is very likely may not differ in any very essential degree from the compounds before described. All of these have the public been thus long beguiled to swallow, and have so patiently tolerated as a prejudice to cheese, which, when made as it ought to be, and fully ripened before using, I am of opinion, instead of being itself difficult of digestion, is a promoter of digestion; and is not only a most substantial part of human diet, but one of our best luxuries. There is yet another bad effect (and that to many not the least objectionable one) arising from the same causes, that is, the destruction they appear (by almost universal admission) to work upon the green mould, generally so called; for it is declared with almost one voice, that the true, rich, green mould is seldom, if ever, met with to any extent or perfection in cheese highly-coloured; a consequence not beyond the power of, at least, some satisfactory explanation. And it may be con-
firmatory evidence here to state, that upon my lately entering a considerable number of cheese-shops in a large market town on the borders of Cheshire, and asking in what sort of cheese green mould is most abundantly met with? the reply was from one and all verbatim, "Oh Sir, in the white cheese." Now the green mould being considered by the most distinguished explorers into the productions of nature a vegetable, as appears to microscopic observation, of the Fungus tribe of plants, and of a peculiar species, called Mucor Casei; and, as we know that all Fungi will vegetate in confined air and from fading bodies; and, as this species appears to require for its support certain properties in the component parts of cheese; so are we entitled to draw the conclusion, that the healthy condition of this pabulum of its life in the cheese much tainted with colouring has been either prevented or destroyed, in a great measure by the active chemicals before mentioned, introduced
into the process of cheese-making. Butter appears to be one of the stimuli or chief supports of the Mucor Casei, for the dairymaids say, nothing so soon or abundantly takes on the green mould as any waste butter, which is collected from the *runnings* of cheese in the press. Then, it being admitted it is in the well-made cheese, without colouring, that the green mould ever grows abundantly, it is no less worthy of observation, the same cheese usually possesses the greatest number of other excellencies; such as, general admixture of butter, uniform mellowness and rich flavour, with fewer of the disagreeables, because the various stages of cheese-making have not suffered that interruption which arises from the heterogeneous compound of colouring. With the collection of so many receipts and proofs before us, as to the destructive effects of cheese-colouring, and the apparent uncertainty of the contents of what may be introduced into other forms
of cheese-dyes not yet brought to light, it needs to excite no wonder that even the high character once so deservedly attached to the cheese of Cheshire should have been forsaking it; and this perhaps in proportion as the colouring (as of late years) hath been the worse adulterated; nor can it be foreseen what injurious or even fatal consequences may follow, if a stop be not soon put to the worse than useless practice under consideration.

And I would here, with the most friendly intentions, intimate the immediate necessity of every farmer's wife, according to the rule of by-gone days, being at the head of her own dairy, if the private advantages of having good cheese, and the waning character of the Cheshire dairy-maids are objects worth restoring. Upon reflecting over all the circumstances connected with this subject, I cannot but express great surprise that, as it was known, at least by some, that fictitious colourings were quickly
invented, (after the first introduction of the Annatto Orellana,) so many years should have passed without inquiry, or any effort made to dissuade the public from their farther use. And much shall I be rewarded if I be only now made instrumental in exposing and terminating the mischief in future to the cheese, and the fraud committed, especially upon that very deserving class, the husbandmen, and influencing them to follow the advice here offered.

I consider myself fortunate in having an opportunity of offering an example worthy of imitation, in a very intelligent farmer, under George Wilbraham, Esq., who is so convinced of colouring being both offensive and pernicious to cheese, that he leaves it out of what is intended for his own table. I am also further informed, this is no solitary case. I shall be also more compensated, if this very important article of food shall, in the result,
be as much bettered in quality as I hope and anticipate; and if the fame for superiority of the Cheshire cheese over most others, which I have been sorry has of late been losing its first place, shall, through my humble endeavours be recovered to the Cheshire dairy-maids, a class of females at once of the fairest bloom; a credit to their families; the hope, and should be, the pride of the country. In conclusion, I must take leave to remind all, and above all, the consumers, or eaters of cheese, that little will be done without their cooperation, by a simultaneous resolve on their part to purchase no more cheese containing any colouring ingredient whatever. And surely little entreaty will be required from me when so much evil is made to appear to arise out of its use, and no good; and as the slightest consideration upon the compositions formed of so nauseating drugs as train-oil, soft, alias, sweet soap, and potash, being introduced
as portions of our daily sustenance, must alone produce the determination to do so.

THE END.
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