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LETTERS

ON THE
UTILITY AND POLICY
OF EMPLOYING
MACHINES TO SHORTEN LABOUR;

Occasioned by the late Disturbances in
LANCASHIRE:

TO WHICH ARE ADDED SOME
HINTS
For the further Extension and Improvement of our
WOOLLEN TRADE
AND
MANUFACTURES.

Upon every *Invention of Value*, we erect a *Statue to the Inventor*,
and give him a liberal and honourable Reward.
Lord BACON's *Atlantis*.

L O N D O N:

Printed for T. BECKET, Corner of the Adelphi, Strand.

MDCCLXXX,

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E R R A T A.

Page 5, line 10, for *adapted* read *adopted*.
 9, 32, after *you* add *afterwards*.
 30, 6, for *materials* read *material*.
 31, 11, for *are* read *is*.

[1]

LETTER I.

DEAR SIR,

HAVING attended with pleasure to the gradual progress of your manufactories, and their various improvements by means of many ingenious inventions, from the first rude attempt to supply them with *cotton yarn*, by a machine erected at *Leominster* about thirty years ago; and having this spring had an opportunity of seeing some of your latest and most perfect machines, by which your cotton manufactures have been supported, extended, and carried to their present degree of excellence; how great was my concern and astonishment to hear that your ingenious workmen should be so far led astray, as to be excited to make war upon the chief instruments of their support, and to the use of which they have seemed many years, to be perfectly reconciled!

I know where working people, or labouring manufacturers, feel, or apprehend evils, they have not always the happiest methods of redressing or avoiding them; and that in their blind rage, they often mistake the nature of things; they destroy what they ought to protect and cherish; they increase their present calamities, and hasten the approach of those that they fear. How frequently, for instance, in dear times, have we seen them destroy-

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ing corn and cheefe, in order to lower the price of provisions! by which outrage the quantity is always decreased, the farmers and dealers are prevented from bringing their commodities to market, and the deluded people go home to their families, not really relieved, but loaded with guilt and sunk deeper in distress.

Errors like these in the working people, are fatal to their own peace, and that of the countries in which they live. They generally proceed from ignorance and gross immorality; and if those in a higher class who live amongst them, and ought to know better, should unhappily have adopted some of the same vulgar prejudices, and instead of correcting the mistakes and bad dispositions of their neighbours, should rather excite and encourage them in their erroneous opinions and turbulent dispositions, the evil must be desperate and the consequences dreadful.

It is not without concern and surprise that I hear it intimated, both by you and other correspondents, that several persons in your manufacturing county, above the station of labourers and working people, are prejudiced against the use of machines in your manufactories, and discourage the improvement of them; which opinion and conduct, if not corrected and altered, I am persuaded will terminate in the entire ruin of your manufactories, and banish them to countries where men are not deprived of the use of their most distinguishing properties.

Man has been defined many ways; and amongst the rest, he has been denominated a reasonable and a risible animal; but as most animals are found to be capable of some degree of reason, and some are thought to be almost as risible as himself, a

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tool-making animal, or *engineer*, has by some been adopted as the best and most characteristic definition of man. And indeed how limited are the faculties of man, without the application of mechanical principles in the construction of tools and machines to shorten labour, and multiply and extend his powers? Without the aid of tools and machines, the condition of man would be truly deplorable; he would be, in many respects, inferior to the beasts of the forest.

It is evident, upon a moment's reflection, that almost every convenience and external comfort we enjoy, depends upon the singular skill of man in the invention and use of machines. By this skill our fields are cultivated, our habitations are raised, our garments are manufactured, our ships are built, and knowledge is acquired and diffused in company with the general advantages of commerce, from pole to pole. Read the history of mankind; consider the gradual steps of civilization from barbarism to refinement, and you will not fail to discover, that the progress of society from its lowest and worst, to its highest and most perfect state, has been uniformly accompanied, and chiefly promoted, by the happy exertions of man in the character of a *mechanic* or *engineer*. Let all machines be destroyed, and we are reduced in a moment to the condition of savages; and in that state man may indeed exist a long time, without the aid of curious and complex machines; though without them they can never rise above it.

But in highly improved, civilized, and commercial states, like ours, machines for expediting labour are *absolutely necessary*; and the constant improvement of them should be encouraged and rewarded by all possible means; otherwise our man-

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nufactories, and those who live by them, must come to ruin.

The chief, and perhaps the only speculative difficulty, concerning the use of mechanical improvements, and machines to shorten labour, is to know *when* and in what circumstances to introduce them; that men's natural powers may go as far as they can, and receive assistance gradually as they stand in need of it. But this time and these circumstances are very distinctly marked in the nature of things; and the *general* rule is infallible, that when by *increase of money, expensive habits of life, and taxes*, the price of labour comes to be advanced in a manufacturing and commercial country, more than in those of its commercial competitors, then that expensive nation will lose its commerce, and go to decay, if it doth not counterbalance the high price of labour, by the seasonable aid of mechanical inventions; by means of which a commercial country may be preserved, and a commercial superiority maintained, beyond the hopes and expectations of those who have not sufficiently attended to the amazing and happy effects of mechanical combinations.

It is upon these principles, and these only, that most of the ingenious manufactories of this country have long existed. *Nottingham, Leicester, Birmingham, Sheffield, &c.* must long ago have given up all hopes of foreign commerce, if they had not been constantly counteracting the advancing price of manual labour, by adopting every ingenious improvement the human mind could invent; by which means their foreign demands have continued, and their people, who must otherwise have starved, been comfortably supported.

It is not, I think, quite fifty years, since the first large *silk mill*, turned by water, was erected in this kingdom;

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kingdom: since that time how many thousands of men, women, and children have been employed, and to what an amazing extent have our silk manufactures, of various kinds, been carried, chiefly by means of machines turned by water and by horses. Without the aid of these very curious and useful machines, it is not probable that half the number of people would ever have been employed in this country, in our silk manufactories; and if whilst other nations had adapted these machines, we had prohibited the use of them, in all probability the manufactories instead of increasing, must have gone to decay.

And I am convinced, my good friend, your cotton manufactory must have sunk long before this time, if it had not received, at a very critical period, the advantage of many extraordinary improvements, and particularly the aid of those curious and excellent *machines* for *carding* and *spinning*, which, beside improving the quality, and keeping moderate the price of your manufactures, have enabled the families of the working people to get much more money than they had ever done before, or can ever hope to do again, until they are fully convinced of the error of their late conduct; and, instead of injuring, are disposed to respect, and honour their ingenious benefactors, the inventors of the valuable machines, they have rashly and wantonly destroyed.

Beside the interruption of our trade, at present, on account of the unhappy wars in which we are engaged, and which will prevent any manufactures from going abroad that are not recommended by their good quality, and extraordinary cheapness, there is another reason why the Manchester cotton-manufactory cannot be supported, and carried on to

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to its usual extent, much less improved and extended, without the re-establishment of the machines the people have destroyed; and that is one which must strike every body with conviction. Through the perfidy and corruption of some of your people, who have more ingenuity than honesty; and through the poverty of others, who have been discouraged instead of being rewarded, our enemies, and most formidable rivals, have got possession of some of your machines; and now you have *disarmed* yourselves, they will meet you at *foreign markets*, and *beat you* with your *own weapons*; those powerful weapons which your infatuated people have thrown away.

How can you hope, in an expensive country, when you have lost many of your distant markets, and the conveyance to others is rendered precarious and difficult; how can you hope, in such circumstances, without the aid of machines, to support a competition against those who will have the advantage of using them? Indeed, my friend, the expectation is, beyond measure, extravagant and ridiculous.

But France is not the only rival you have to fear; your machines may possibly be employed to your disadvantage in other places, and your ingenious work-people may soon come to want business and bread; and nothing, in all probability, can prevent it, but a determination, a resolute and united determination, through your whole manufacturing district, to restore the machines, and give your *cotton manufactory* every possible advantage.

I have long seen, with a sort of enthusiastic pleasure, the possibility of carrying this branch of your manufactory to a vast extent; and have observed with great satisfaction the rapid progress
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you have lately made, and the many improvements that have been introduced: but if you proceed steadily and wisely, I am persuaded you will find this branch is yet only in its infancy; that you have not even arrived at its *first principles*; your first operations being *essentially erroneous*, so as to affect the work in every succeeding stage. When the present fever is over, and your neighbours recover the use of their understanding, this defect may be remedied, by a *poor man* in your country, who deserves *affluence* and a *statue*: but dainties must not be thrown before swine; lest they turn upon their benefactors, and tear them to pieces.

In the mean time, I hope the deluded people may be convinced of their errors; and that as you can expect no demand in the present situation of affairs, unless your articles are remarkably good and cheap, that the workmen will be persuaded to adopt every method likely to make them so; and not expect to support a manufactory by *dear* methods of labour, which can, with difficulty, be supported by the *cheapest*.

These, my good friend, are my first thoughts upon this interesting subject. If they should be approved by you, and the respectable gentlemen mentioned in your letter, I shall be more confirmed in the truth and propriety of them; and am always,

Dear Sir,

Your affectionate friend,

Nov. 19, 1779.

T.

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LETTER II.

DEAR SIR,

IN my last letter I gave you my first thoughts on the use and necessity of *machines* for shortening labour, in rich and manufacturing countries; and particularly in ours. I endeavoured likewise to ascertain the general *æconomical principle* which ought to regulate their introduction: and I shall now trouble you with some additional observations.

It must be evident to every one who will open his eyes, and make the smallest use of his understanding, that all human arts are carried on by *machines*; and that without them man would perhaps be the weakest and most wretched of all God's creatures. It is equally plain that in proportion as man advances in society, and his dependencies and connections become more extensive, his wants increase beyond his natural power of supplying them; and that these extensive connexions can alone be supported, and these wants supplied, by the aid of mechanical principles; the knowledge of which extends the dominion of man over the powers of nature, and all other beings that surround him; according to that excellent maxim of *Lord Bacon*, that KNOWLEDGE IS POWER.

The necessity and utility of *machines*, from which we derive almost all the conveniencies of life, cannot be doubted: the *general rule* is sufficiently plain, and the only remaining difficulty that can occur to political, and *æconomical* speculatists respecting their use, is *precisely* in what circumstances, *new improvements* of this kind may

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may be advantageously introduced? And the truth is, that the *course of events* or the *state of things* generally resolves this seemingly difficult question without waiting for the doubtful decisions of human wisdom, or the speculations of statesmen.

In manufacturing and commercial countries, when demands from abroad slacken, and foreign competitors working cheaper, endanger the loss of a manufactory, then necessity sharpens the human intellect; men's geniuses awake, and are animated; and discoveries are made that astonish the world. The manufactures are greatly improved in quality, or cheapness, or both; and thus a whole country is frequently preserved from want and beggary, by the seasonable invention of a new *machine*.

This, my good friend, was precisely your case some years ago. In the year 1766, your cotton manufactory was in a declining condition; and you applied to Parliament for relief; which you expected from a *free port* in the West Indies, and the *free importation of cotton* from all parts of the world. Your complaints were attended to; and your desires, in a great measure, complied with: but you were not effectually relieved. Your application for a greater quantity and variety of raw-materials however was reasonable; and this is a subject of the first importance to you as manufacturers.

But what advantage could you derive from large quantities of *cotton* without *spinners*; and large heaps of *goods* in your warehouses without *customers*? It seemed a paradox, nay almost a miracle to all the world, that you lost a whole continent, containing some millions of constant customers; and yet that you did not experience any considerable distress! Supposing the colonies purchased from
C England

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England to the amount of *three millions* per annum ; Manchester may reasonably be supposed to have furnished at least one tenth part of this sum ; and one would think a demand to the amount of *three hundred thousand pounds a-year* could not be lost, without being very sensibly felt in that place and neighbourhood. The *machines* for *carding, roving* and *spinning cotton*, those ingenious *machines* that, in a fit of madness your people have lately destroyed, can alone unfold the mystery. These *machines*, which ingenuity had long been labouring to produce, and which about this time, were happily brought to a considerable degree of perfection, enabled you to make your goods *better* and *cheaper* than usual ; which produced new and extraordinary demands from the continent of Europe, and saved your work-people and manufactories from distress and ruin.

By this means chiefly, my good friend, your trade and manufactures have been supported, improved, and extended : a large quantity of cotton yarn, and of superior quality and fineness, has been produced : the common people have been long perfectly reconciled to the use of the machines, by which their families have been enabled to live in plenty and affluence ; and the foreign demands have for some years given life and vigour to your *cotton manufactories* ; though, in the mean time, I am informed, the linen branches of your business, which have not had the same benefit from your machines, have considerably declined.

Upon the whole, however, your manufactories have been pretty well supported for several years ; and your people have continued in good humour with their *machines*, until the late *fatal moment*, when this destructive war, spreading like a conflagration,

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flagration, having almost deprived you of your *new* and *precarious* markets ; and the *Irish non-importation agreements* farther contracted your *old ones*, the general demand for your goods very *evidently diminished* ; and the work people began to experience a lowering of wages and to apprehend a want of employment. In this state of things the minds of the people began to be uneasy ; and being ignorant or *misinformed* of the true cause of the evils they felt or apprehended, upon a *report*, that a proprietor of one of the large machines (when cotton was advanced upon the news of the loss of the Island of Grenada) offered to spin cotton at a lower price than what was then generally given, these mistaken people foolishly and wickedly set about destroying those machines, that had suspended the date of their distresses several years, and from which alone, in the present state of public affairs, they could hope for relief. For I would ask any of your sensible weavers, many of whom I know can reason better than some of their superiors, when they are furnished with facts, and are not in a passion, whether they can spin as much yarn without the use of their machines as with them ? My honest friend will doubtless say *no*. Whether they can weave more yarn than is spun ? I am persuaded, to this question he will likewise say *no*. Whether they can make goods as good and as cheap without the help of their machines as with them ? My honest friend will probably acknowledge they cannot. Why then did you break the machines ? Because we apprehended the machines would lower the price of spinning. And suppose they had ; you would not have woven the yarn unless there had been a demand for goods, and then the more and the cheaper you could get of it the better it would

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have been for the whole manufactory. But we apprehended there would not have been employment both for them and us, and our families. Why not? Have not these *machines*, and your *families*, and your *looms* been well employed several years, to the general emolument of masters and weavers and spinners—and consequently to the advantage of the neighbouring gentlemen and farmers; why therefore are you afraid *now*? Is not your demand as great as ever, and are not your wages as high? No: Our masters tell us the demand is less; and are lowering our wages. But you do not imagine the machines made the demand less, any more than your looms? No, I do not see how they could. Then the looms and machines are equally guilty of making too many goods; and in justice you ought to have broken as many looms as machines; because if there is no demand, the number of looms lowers the wages as well as the machines. So it should seem: And yet I am convinced our trade is not in so good a way as it has been, and that there must be some reason for it. No doubt; there is no effect without a cause; but you ought to have found out the reason before you had done so much mischief, and laid violent hands upon the innocent machines. Can you think of no other reason but the cheapness of spinning, for your having less work and your masters less demand for their goods than formerly? Perhaps, master, you may think these wars have hurt us; and that they are the principal cause of the slackness of our trade? It is a glorious thing, my honest friend, to discover the truth; and to embrace it heartily when we have found it. Do not you think the war a more probable cause of the badness of trade, than the number of spinning-mills and jennies;

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jennies; that the loss of three millions of customers; the war with France and Spain and America at the same time; and the Irish non-importation agreements, are sufficient to interrupt your trade, and produce all the distresses you feel or fear? I thank you, Sir, for this explanation. I am afraid we made a terrible mistake some years ago, when we were all in an uproar for war; and that we petitioned on the wrong side. I am afraid indeed you did; and that you will have cause to lament this folly as long as you live. But suppose, my good friend, you were to petition more wisely now, and that notwithstanding all your petitions and grievances the *war*, the *sole cause* of all your misfortunes should be continued; that the risk and expence of carrying your goods, should increase their price at foreign markets, and that the French, by means of the same machines, as those which you have rashly destroyed, should take this advantage, and supply Germany, Spain and other countries cheaper than you, I am afraid you might not be able to sell the goods made *without* the help of your machines *AT ALL*; and that there might be some danger your foreign trade would be *entirely lost*. You know people will not buy *dear* goods when they can buy *cheap* ones; and in your present circumstances, if your goods do not rather *improve* in quality and cheapness, you can have no reasonable hopes of a foreign demand. If you do not lead the way, and go before all Europe, as you have done of late, by means of your machines, and as Birmingham has done, and I hope will continue to do, you will lose your credit and superiority at foreign markets, and in losing them you will lose your trade.

To prevent this fatal calamity, if we cannot have the blessing of peace (the only effectual remedy)

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medy) you must endeavour to alleviate the evils you cannot avoid, by extraordinary *sobriety* and *industry*; and study to lower the price, and improve the quality of your goods, by all possible means, so that they may recommend themselves, and force their way, through all difficulties, to foreign markets: but carding and spinning machines are now become as necessary as your looms, and you may as well think of demolishing the latter as the former.

The oldest method of spinning we know, and perhaps the best, where price is not considered, is performed without any wheel at all: it was practised by the most ancient nations; it is still practised in some half civilized countries, or such as have little commerce; and, I believe, is yet known in the county of Norfolk, under the name of *roque spinning*: but this and all other methods of spinning, without great advantages from machines, are incompatible with the present expensive way of living in this country, and the existence of our commerce: tho' I do not doubt, but at the first appearance of wheels, there must have been a terrible scuffle between these machines and the distaffs, to the great disturbance of many a happy neighbourhood. New truths, new machines, new medicines, and new improvements of all kinds, by which the condition of human life has been made more comfortable and happy, have always been persecuted by ignorant people and bigots, and with great difficulty gained permission to enlighten and bless mankind.

But we must not deviate too far from our present humble subject of *spinning*, which, I would observe, being one of the first stages of a manufactory, and coming next after the cultivation of the raw materials, naturally belongs to countries where people

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people live much cheaper than in this, and can afford to perform these first operations upon lower terms: and on these principles the bulk of our *linen yarn* has long been purchased from Ireland and Germany; because, as every body knows, it could not have been purchased in sufficient quantity, and at the same prices, in England. Nor do I suppose all the spinners in Lancashire could have produced one-fourth part of the cotton yarn that has been worked up in the last seven years; and consequently, that not one-fourth part of the cotton goods could have been made and sold without the extraordinary assistance of the new machines: *if therefore you would not entirely lose your business, these machines must be re-established, supported, and carried to all possible perfection.* Indeed, my friend (I am speaking yet to my honest weaver) I think you and your masters should lay what is past seriously to heart, and beg pardon of God for your manifold sins and transgressions; and that after repentance, you should mutually forgive each other, and join heartily in making the best of your present circumstances; for certainly no folly can equal that of petitioning government, in an unconstitutional and unrighteous quarrel, to beat their *oldest and best customers*, unless it be *yours* of making war upon the machines that had procured *them* new ones, and saved *you* from impending ruin.

I now take leave of my weaver, and of the subject, and have no more to say at present, but that I am always,

Dear Sir,

Your affectionate,

T.

Nov. 22, 1779.

LETTER

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L E T T E R III.

DEAR SIR,

I HAVE never seen or heard of any very considerable or even plausible arguments against the use and constant improvement of *machines* in manufacturing countries, except such *cogent* ones as have lately been applied in Lancashire, or I should have been glad to have stated and examined them. It has, indeed, been insinuated, but never proved, in any instance that I know of, that machines may be unfavourable to population. All the instances I have known or can recollect, are clearly on the contrary side; and considering what serious mischief such vulgar prejudices have frequently produced, it is time they should be exposed and abandoned.

There can be no reason, I apprehend, against the use of *new machines* in manufactories, that does not militate against every human improvement; and that would not strip mankind of all their peculiar privileges, and turn them again naked into the woods. Every new invention, every useful improvement must unavoidably interfere with what went before it; and what is inferior and less perfect must give way, and ought to give way, to what is better and more perfect. The transition indeed cannot always be made without inconvenience to some individuals: but this proceeds from the progressive nature of things, and the general order of Providence; and cannot be prevented

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vented without destroying the main springs and first elements of the moral world.

It is true, that poor nations, living chiefly on agriculture, and that have no foreign trade, stand in less need of machines, as they have no foreign competition to support; but even in such countries the earth might be forced to produce more food and raiment, as well as materials to shelter the inhabitants from the inclemency of the weather, *with* the help of machines than *without* them; and consequently those countries would become more populous.

If any one can doubt the truth of this conclusion, let him look for a confirmation of it, where there are the fewest machines, in the almost depopulated state of savage countries.

New Holland, which is perhaps as large as all Europe, and some parts of which are situated in one of the finest climates in the world, probably does not contain as many inhabitants as the smallest of those kingdoms or states into which our continent is divided; and even those few inhabitants are in a condition little superior to the brutes.

Instead of supposing then that the *use* of machines is in any case unfavourable to population, it would be much more reasonable to conclude, that *nations are populous in proportion as they make use of machines.*

Prejudices against new inventions, and groundless fears of their bad consequences, are injurious to every country, and have been so to this. These prejudices have occasioned the neglect and ill treatment of some of the most useful members of society, under the name of projectors; who, it must be acknowledged, are often chimerical and extravagant in their expectations; but whose warm

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brains generate those prolific seeds, those new ideas, and combinations of ideas, which persevering industry broods upon, and brings to perfection; and the fruits of which often support and enrich ungrateful multitudes, who are too apt to forget their starving benefactors.

Towards the end of the 16th century, in the reign of Queen *Elizabeth*, an Englishman invented that curious machine, the stocking-frame; but being discouraged in this country, the inventor was driven into France, and, perhaps, from thence to other parts of Europe (for the history of this valuable invention has not been so clearly recorded or made public as its merit deserves) from whence some time after this machine returned back to its native country, and laid the foundation of that vast commerce in the stocking manufactory, which we have long enjoyed; and which, if the inventor had been duly encouraged at first, would probably have been much more considerable than it is, if not almost exclusive; because, by means of priority, in time we should have got the start of all our competitors; an advantage which when once lost is hardly ever to be recovered.

Nor is it a trifling consideration to this country, that the discouragement the ingenious inventor of the stocking-frame met with, gave our rival nation a plausible pretence for claiming the honour of so valuable a discovery. I do not know which of their authors first asserted this claim: but it is curious enough to observe how ingeniously they have contrived to reverse the history. One of their late authors, or rather compilers, speaking of the stocking frame, has the following passage; "The English boast of being the inventors of it; but they attempt, in vain, to rob France of this honour.

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Every body knows now, that a *Frenchman*, having invented this surprising and useful machine, and finding some difficulties in obtaining an exclusive privilege, which he required to establish himself at Paris, went over to England, where his machine was admired, and himself magnificently rewarded.*

The same author informs us in the next page, that the first manufactory of frame-worked stockings was established in 1656, in the *Chateau de Madrid*; a royal house, formerly in the *Bois de Boulogne*, near Paris.

Mr. Chambers, the author of the *Dictionary of Arts and Sciences*, has too hastily adopted this erroneous account from some French writer; which is in part corrected by the authors in another *Dictionary*, published by *Owen*; who say, that "whatever pretensions the French make to this invention, that the same was certainly devised by *William Lee*, of *St. John's college, Cambridge*, in the year 1589, though it is true that he first made it public in France, after despairing of success in his own country; which account agrees with a *memorandum* I have lately seen in an old printed sheet of *Rules by the Master and Company of Frame-work Knitters*, engraved under the arms of the company, with a master of arts in his gown, and cap on one side, and a female figure on the other, by way of supporters, in the following words: "In the year 1589, the ingenious *William Lee*, master of arts, of *St. John's college, Cambridge*, devised this profitable art for stockings; but being despised, went to France: yet of iron to himself, but to us and others of gold, in memorie of whome *this* is here depicted."

* Dict. des Arts et Mètièrs; Art: Bonnetier.

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But in order to induce you, or some other of our friends, who have more leisure than I have, to look farther into this curious and national subject, I shall transcribe another and still fuller account of this invention.

"In this year, 1589, *William Lee, M. A.* of *St. John's* college, in *Cambridge*, invented an engine, or steel loom, called the stocking-frame, for knitting or weaving of stockings. This was but twenty-eight years after we had first learnt from *Spain* the method of knitting them by wires or needles. Mr. Lee's invention has proved a considerable benefit to the stocking manufacture, by enabling *England*, in aftertimes, to export vast quantities of silk stockings to *Italy*, &c. where it seems, by Sir Josiah Child's excellent Discourse on Trade, first published in the year 1670, they had not yet got the use of the *stocking-frame*, though little short of one hundred years after its invention. Yet *Dr. Howell*, in his History of the World (Vol. II. p. 222.) makes this invention eleven years later, viz. *Anno* 1600; and adds; that *Mr. Lee* not only taught this art in *England* and in *France*, but his servants did the same in *Spain*, *Venice*, and *Ireland*."*

In the same manner the French, who have persuaded the world to give them more credit for invention than they deserve, will probably, some years hence, lay claim to the invention of the *wheel-shuttle*, which, with its inventor, the late *Mr. John Kay*,† of *Bury*, was, by ill usage, and

* Anderson's Chronological Deduction of Commerce, &c. vol. i. p. 435.

† I have a great many more inventions than what I have given in: and the reason that I have not put them forward, is the bad treatment that I had from woollen and cotton factories, in different parts of *England* twenty years ago: and then I applied

and a violent mob,‡ driven over to the continent; to the *horse calendar*, smuggled out of your country into *France*, with many other valuable articles, by *Mr. Holker*; and to your admirable machines for carding and spinning cotton.

If you do not take care to encourage the use, and to preserve the history of these inventions, for the honour of the discoverers and the kingdom, you will not long enjoy either the advantage that may be derived from them, or the credit of inventing them. And besides, to record and publish the inventions of ingenious artists, and to take care that the fame of singular ingenuity do not expire with the possessor, would be one of the most animating motives to further exertions and improvements, and ensure you a rich harvest of future discoveries. The fruits of genius, like those of the earth, will be most abundant where the plants are cultivated with the greatest skill and attention; and where these are neglected, or harshly treated, they will pine away, or barely exist without utility or beauty.

Perhaps no nation has produced more original geniuses than this: and that we might be safe in observing, as a worthy friend of ours once did to an illustrious foreigner, who was making the common but erroneous remark, that the French excelled most in invention, and the English in making improvements, that if Great Britain was cut out of a map of Europe, the piece could not be

I applied to parliament; and they would not assist me in my affairs, which obliged me to go abroad, to get money to pay my debts and support my family.

MSS. Letter of *Mr. John Kay*, sent to the Society for the encouragement of Arts, &c. in the year 1764.

‡ See Considerations on Weaving, &c. by John and Robert Kay.

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laid upon any other part of the map, that in the same compass, had brought forth an equal number of important discoveries and original inventions; and I will add, if there should be such a district, I am persuaded it would not be found in France; though the French must be allowed to have great ingenuity, and to excel in perspicuity of explanation and methodical arrangement.

But however this enquiry may turn out, let us, my good friend, take care if possible, of those useful machines that have been lately invented. We shall have occasion for every aid which ingenuity can supply: for as things are now circumstanced in this country, and particularly in Lancashire, there is little room for doubt or hesitation. You must either give up your manufactories, or the people their prejudices.

Nay, I cannot conclude without going a step farther. Tho' your machines have wonderfully supported your manufactories for several years, and made your fall gentle and almost imperceptible; tho' I think their immediate re-establishment advisable and absolutely necessary, yet, I am afraid, even these prudent measures cannot support you in the present hour; when your access to many foreign markets is entirely cut off by the war, when the conveyance to others is rendered difficult or expensive, when the home consumption of every thing is greatly lessened, by the scarcity and advanced price of money, and when Ireland, instead of being a customer, is coming to be a partner in the business, and to share with you in supplying the few markets that are left.

While the European markets were open, and while America was in some measure supplied with your articles in an indirect way, your machines effectually

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fectually supported one considerable branch of your commerce: but they are not sufficient to counteract all the obstructions with which you are at present surrounded, and which are daily growing greater and more formidable. I fear no machines can restore what you have lost, until the great *machine of state* is thoroughly repaired and put in order; until your former markets are restored by a *general peace*, and until the present intolerable load of taxes is put into a way of being gradually diminished.

By an act of the 18 *George III.* you know *cotton yarn* is permitted to be imported into *Great Britain* from *Ireland duty free*, and that that country, without a proportionate load of debt, is going to be farther indulged with a free trade. That *Ireland* should be put upon *as good* a footing as *Great Britain*, with respect to commerce, is just and reasonable; that she should be put upon a *better* footing would be the height of injustice to this overburthened and sinking country: but it would be foreign to my present purpose to say much now upon this delicate subject; and I will only add, that I wish you to consider, I mean, I wish the weavers and spinners in Lancashire to consider, whether it would not be desirable for them and their families, to share with those of their sister kingdom, in the advantage of supplying you with the great quantities of *cotton yarn* you will stand in need of; the demand for which I hope will soon be revived and increase with the progress, improvement, and extension of your ingenious manufactories.

I am, Dear Sir,
Yours, &c. T.

HINTS

H I N T S.

OUR woollen manufactories have probably suffered full as much by this unsuccessful and impolitic war as those of Lancashire, without having had the benefit of the same supports: but I am inclined to hope the foregoing letters, with what I shall now take the liberty of offering to the consideration of our staple manufacturers, may furnish them with some useful hints, for the improvement of that valuable branch of business in which they are engaged.

Without recurring to the small demand for wool, and the great quantities that lie upon the hands of the farmers and wool growers in some parts of the kingdom, it is evident, from many indisputable symptoms, that our woollen trade has of late greatly declined, and that if the present obstructions continue much longer, it is in danger of sinking still lower; to the great loss of the manufacturers and the nation, and to the distress of thousands of industrious and valuable workmen.

This alarming state of the manufactory certainly demands the attention of all who are particularly concerned in it; and in order to discover

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suitable remedies, I beg leave to offer to their consideration the following propositions and remarks.

For a manufactory to be in a good state, the following conditions are requisite.

It should have a great variety and plenty of raw materials, at a moderate price, either in the neighbourhood, or, if possible, within the limits of the same government, that it may not be liable to frequent interruptions from the difficulty of coming at materials.

It should have great numbers of work people to perform the first operations, such as carding, combing, spinning, &c. *very cheap*; and these may be situated either in the manufactory or at some distance, or both—for *yarn* is itself a manufacture suited to cheap countries, and may often be advantageously *bought* by manufacturers who live, and can afford to live, in a dearer country.

The last operations should be well and skilfully performed; so that the commodity may recommend itself by goodness, comparative cheapness and beauty.

All these preparations will be ineffectual, unless the manufacturers have access to *markets* sufficient to employ their people, and keep up a vigorous and increasing demand.

First. At present we have *wool* in plenty, though not perhaps in sufficient variety, owing to the difficulty of late of procuring as much Spanish wool as we want at a moderate price: but the cheapness and plenty of our wool is no advantage to the manufacturers, where there is no demand for their goods, and a very great hardship upon the farmers.

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farmers. To remedy these inconveniences in some measure now, and to prevent their existence for the future, I beg leave to propose to the consideration of our manufacturers of wool, a very unpopular, but I am persuaded a sound and advantageous measure, *to allow the EXPORTATION of wool when under a given moderate price*, paying a moderate duty, about equal to the expence of smuggling; from which I think would flow several advantages. The *wool grower* would be encouraged to keep up and improve his breed of sheep, and enabled to pay his rents, when the home-demand might happen to decrease; the manufacturer would be sure of a constant supply at a moderate price; and the foreigner could not work up any of our wools without paying in duty and freight fifteen or twenty *per cent.* more for the raw-materials than our own manufacturers: so that we should be getting something for our produce in the worst times, and our manufacturers would buy our wool cheaper than foreigners at all times.

Every body knows *corn* has been much cheaper, upon an average, in this kingdom since the exportation has been encouraged than before; and that the growers and consumers have each suffered much less than formerly, from those extreme risings and fallings with which they used to be alternately distressed.

Beside allowing the exportation of *wool*, under some restrictions, those who are particularly interested in this branch of business, should also exert themselves to find out, if possible, means of raising a greater variety of sorts of fine wool within the compass of the British dominions; that it may

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may not be in the power of any foreign state to distress us, by prohibiting its exportation from their respective countries.

A commercial nation should never be afraid of having too great a quantity of any valuable materials; because the excess may always be exported. We all know that sugar was not cheaper here than usual during the last war, when almost all the sugar of the West Indies came to England; because the production of America and the consumption of Europe continued to bear the same proportion to each other; and we reaped the commercial advantages of importation, commission, exportation, &c. with some duties; and upon the same principles, all narrow prejudices apart, I am persuaded it would be an unspeakable advantage to this country, if we should ever come to an amicable settlement with America, to allow the free importation of all sorts of grain from that country, which we might dispose of at other markets, and which would enable them to take from us much greater quantities of our woollen and other manufactures than they could ever pay for any other way.

Secondly, For the relief of the woollen manufactures, with respect to some of the first operations, the remedy, after reading the letters on machines, must, I think, be obvious. Let similar machines to those invented in Lancashire, but particularly adapted to the carding and spinning of wool, be put into the hands of the *wool* and *jersey spinners*, &c. the consequences of which will be, that the *spinners* will get *three* times as much money as they have hitherto been accustomed to do; that they will make *much more yarn*, *much better*, and *much cheaper*; and consequently that the manufac-

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ufactures will be so *improved*, and brought to market to so much greater advantage than usual, that the *demand* will probably increase, even under all our present difficulties and obstructions; and if peace should soon be happily established, and the way to foreign markets be made more open and easy, the prospect of improvements, and of the extension of our woollen trade, would become great and even boundless.

We must change our methods of proceeding with the state of things, which are always changing; or we must keep within our own island, and resolutely cut off all communication with the rest of the world. We cannot make *cheap* goods in *dear* times, and under *high taxes* and *expensive habits of life*, without *extraordinary assistance*. The competition of Europe is now become rather a contest in skill and ingenuity than in natural strength. If all trades were as open as a liberal plan of policy would make them, the greatest advantages would fall, as they ought to do, to the lot of the greatest ingenuity and application; and I am persuaded this kingdom has no reason to fear such a contest.

The only difficulty that can happen in the introduction of these machines will arise from the groundless fears and prejudices of the work-people; to prevent which their employers should throw the machines as much as possible into their hands, and let them experience, in the first instance, the great profit of employing them. A woman in Lancashire who used to get 2s. 6d. or 3s. a week by spinning cotton with the hand and the old wheel, when she got a *Jenny* would earn from 7s. 6d. to 12s. a week; and so I am persuaded

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suaded the woollen and jersey SPINNERS may do when they have the same advantages.

A manufactory, without great help from machines, and constant improvements, can be but of small extent, will soon arrive at its utmost limits, and consequently can employ but a small number of people; and if rivals in other countries learn cheaper methods of working, such limited manufactory will lose its markets, and go to decay: but let the same manufactory have the benefit of ingenious machines, by rendering its productions better and cheaper, it may come to employ ten times the number of people it could ever have done in its former state. Its prospects, from being very narrow, would soon become considerable, and expand with its improvements. These effects are infallible; all the flourishing manufactories in Europe are proofs of them; and every person who will open his eyes, and is in the smallest degree capable of comparing things and drawing conclusions, that is, every reasonable being may be convinced, that in like circumstances they will every where take place.

Thirdly, Improvements in carding spinning, &c. will of course produce improvements in the quality at least, and cheapness of the goods; they will also probably enable the manufacturer to recover old articles, such as camlotts, for instance, which have been lost, because the old methods of spinning, &c. were too dear; and to invent many new ones, which could not be made with the yarn spun in the old method. By means of the proposed improvements we may hope particularly to recover what we have lost of the Turkey trade, and to supply the southern parts of Asia, and other

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other warm countries, with much greater quantities of our woollen manufactures. In the *lower* articles it would be proper also, if possible, to find out some more *dispatchful* methods of *weaving*. Many articles have been lost to this country for want of such improvements; and would it not be better for a workman to be able to do twice as much with his own hands, than for him and his children to starve and do nothing? They will say, I know, if we have not *full* work now, what will become of us if we make twice as many goods? It is a proper and a serious question, that ought to be answered with all possible plainness and simplicity; and I hope I shall be able, if he will have patience, to give the honest querist satisfaction.

You have not full demand for your goods now, perhaps because they are too dear; and the difficulty of conveyance to foreign markets makes them still *dearer* than usual. Or if you have a great demand for any particular sorts of goods, those large demands are generally for low priced articles, of which you sometimes cannot produce half the quantity wanted. If you could with equal ease to yourselves make the fine goods *cheaper*, and the coarse ones both cheaper and in *greater quantities*, it is probable the demand for both would increase; that three or four times the present quantity of goods would be made; and more than twice the number of people be employed in the manufactory; to the great emolument of the wool-growers, the staplers, the combers, the spinners, the weavers, the manufacturers, the merchants, the land-owners, and indeed the whole kingdom; for independent of the general balance, who is not in one way or other concerned in the success of our staple manufactory? But in the first place it is necessary to

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increase the *quantity* of spinning; because it is impossible to extend a weaving trade without a previous plentiful provision of *yarn*; and when you have yarn enough and demand enough, you certainly can have no objection to make use of the same advantages that support every other manufactory. If you lay aside your prejudices, and heartily concur in the measures now proposed, by a zealous friend to the ingenious workmen and manufactories of this kingdom, you will lay a happy foundation of support for yourselves, your families, and your posterity, as well as contribute essentially to the benefit of your country; but if you obstinately reject the above advantages, your trade can never be extended; and in the present state of things must go speedily to ruin.

To illustrate this subject, and make it, if possible, still plainer, let us suppose that there were only two woollen manufactories in this nation, and no foreign commerce; that one of these manufactories was situated in the north, and the other in the south; that they employed each 1000 hands; that provisions were nearly at the same price in both parts of the kingdom, and they made the same kinds of goods. If these manufactories were 200 miles asunder, their markets would meet about half way, and neither of them would expect to sell their goods beyond this natural line; because the expence of *carriage* would be against the manufacture that was sent beyond these limits. Let us suppose, however, provisions to rise in the south, and consequently the price of labour to rise there also; but both to remain the same as at first in the north. The northern manufactory would soon gain upon the southern markets, and instead of 100, would gradually supply 110, 115, 120, &c. miles, while the

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the space the southern manufactory could supply would gradually contract to 90 miles, 85 miles, 80 miles, &c. so that the demand there would be daily diminishing, and the people would begin to leave the south, and go into the north for employment, where the demand would be constantly increasing; and instead of 1000, they would have employment for 1500 people; while the other manufactory could scarcely employ 500. The cheapness of the goods made in the north would in time draw all the demand thither, as well as the work people, and if no measures were taken to prevent it, the southern manufactory would go to ruin, and the other would, on the contrary, increase and be established. All this might be effected, and would certainly be effected by an advantage in the price of labour, if no steps were taken to counteract that effect; but we will suppose when the southern manufactory was considerably diminished, an intelligent manufacturer, who had both invention and taste, contrived a *shuttle*, by means of which one man could do the work of two, in the coarse goods, and that he likewise made several improvements in the colours and patterns of the finer goods; and that the people, instead of abusing him and breaking his shuttles, speedily adopted them, and imitated him in his other improvements; in this case, as the coarse goods could be made much cheaper, though each separate weaver was paid more for his personal labour, and the fine goods were much more acceptable by being more beautiful, the demand for both would soon return to the south, that for the coarse cheap goods would considerably increase; the double quantity of work performed on the coarse articles would all be sold, as the goods

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would be much cheaper than those that were made at the other manufactory of the same kinds; and double the number of looms being now set up, they would not only employ all the weavers that half the number employed before, but *twice* the number of work-people, depending upon the quantity of yarn worked up. Twice the quantity of wool would be wanted; twice the quantity of carding; twice the quantity of spinning, &c. so that the number of people employed by this single invention would be exceedingly increased, and this manufactory would more than counterbalance the low price of labour in the north; so far even as to draw back the people that had gone thither from the other, and in return endanger the ruin of the northern manufactory; where every thing and person depending upon the manufactory would languish, and the country be greatly distressed.

If, upon an attempt to introduce the shuttles into the northern manufactory; upon a decline of trade, the mistaken people, instead of receiving them with joy, should rise in mobs and break them to pieces, the total destruction of their manufactory would probably be the consequence, while that in the south would rival them at their own doors, and get all their work-people and their customers.

By this prudent conduct the southern manufactory would become famous: but should the northern manufactory overcome their prejudices before the people were entirely dispersed, their business might revive; they would have some advantage in the lower price of labour; they would probably succeed well in the low-priced goods; while those in the south would be most famous for the *fine*; and in this state the country would become famous, and

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and an extensive *foreign* commerce might be established and supported to the benefit of the nation for many years. It would however be limited and counteracted by foreign rivals, sometimes losing and sometimes gaining ground, as the varying price of labour and exertions of ingenuity should reciprocally take place; and if the price of labour should gradually rise in this country more than in the neighbouring nations, many articles might be lost; we might be beaten out of some distant markets, and the manufactory might gradually decline from this circumstance of the price of labour only.

Fourthly. But supposing the goods to be well and skilfully manufactured, and a very extensive commerce established; supposing likewise the advancing price of labour was in some measure counterbalanced by the aid of machines, and peculiar care and skill in finishing the goods, yet it is possible that by a very *general* and *unsuccessful* war, by the advanced prices of *freight*, *insurance*, &c. our manufactories might experience unusual difficulties, and be in great danger of ruin for want of foreign markets to which our manufacturers could have access.

In such a state of things, which I am sorry to observe is nearly our present condition, what is to be done? Are we to sit tamely down, and view with idle and ineffectual lamentations our approaching distresses? Or must we exert ourselves like men, and resolve by the most rational means to avoid them? It will answer no good end to deny the truth, and ridiculously to boast of our health when every symptom of a fatal disease is manifest. Some of our markets are lost; others are rendered difficult of access; the home consumption is greatly diminished; *Ireland*, without a propor-

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proportionate load of debt, will meet our manufacturers of wool at *home* and at *foreign* MARKETS, and every one who is accustomed to commercial and political questions knows that one *third* at least of the value of every piece of goods finished in this nation arises from taxes; perhaps considerably more. This is the *weight* that our manufactures of all kinds have long existed under. It operates as so much duty upon the exportation of them. To the abovementioned circumstances we must now add the extraordinary advance of insurance, freight, &c. brought on by the war; and then no man can wonder that their *wool* lies upon the farmers hands; that rents are not paid; and that all the landed property in the kingdom has sunk one *third* in value. That is, in a few years we have completely undone the business of a century; money being *advanced*, and lands *lowered* to the prices they were at about one hundred years ago!

It must be evident to any person who calmly considers the present state of things in this country, that our manufactures and all our property must still suffer more, unless some speedy and powerful remedies be applied.

The grand object must be, to remove, as far as is practicable, all the obstructions between us and our *old markets*; and as *Ireland* is to share with us in a free trade, if possible to find new markets, that there may be room enough for us all.

But we can neither supply *old markets* nor *new ones*, if our heavy taxes, and consequently the price of labour, already much too high, should daily advance.

There are several ways of lowering the price of labour in a country. The first, most salutary, and most

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most consistent with true policy, is lowering the expences of government.

The second, which would also be very judicious, and make our connexions with the *East Indies* somewhat less alarming, as well as our property more real, to take as much *fiatitious money* out of circulation as possible immediately, and gradually to diminish it. The contrary policy is one principal cause of the present deplorable condition of this country. This principle will explain to the intelligent reader why Europe, so long as its present policy exists, can never safely have a free trade with the East Indies, into which the riches of Europe have been flowing for ages, without considerably advancing the nominal prices of labour. Much more might be said upon this very curious and interesting subject: but I must leave it to public consideration, and proceed to the *third* method of reducing the price of labour, which high taxes and expensive habits of life force manufacturing countries to adopt; and that is the use and constant improvement of *machines*, to counterbalance taxes and shorten *labour*.

If all these measures were adopted; if the taxes were reduced; if considerable quantities of *paper money* were taken out of circulation; and if our manufacturers of wool, in particular, were to adopt with vigour the use of *spinning machines*, which I would earnestly recommend to them; nay, if the last measure only was pursued, their manufactures would be made much *cheaper* and *better*, and they would have *some chance* of forcing their way to *foreign markets*, of recovering those that have been lost, and of producing demands from *new ones*: but in our present involved and intricate situation, I apprehend the only *effectual* remedy for the alarming

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ing decline of our manufactories and commerce, and all our other calamities, will be for us, like men who have recovered their senses from a strange infatuation, who have opened their eyes upon the brink of a precipice, to tread back our deluded steps with anxious speed ; and to finish a *tragedy of errors*, with the happiest *catastrophe* in our power.

F I N I S.