William Stanley Jevons, "The Coal Question; An Inquiry Concerning the Progress of the Nation, and Probable Exhaustion of Our Coal Mines," 1865.

[A]s the source especially of steam and iron, coal is all powerful. This age has been called the Iron Age, and it is true that iron is the material of most great novelties. By its strength, endurance, and wide range of qualities, this metal is fitted to be the fulcrum and lever of great works, while steam is the motive power. But coal alone can command in sufficient abundance either the iron or the steam; and coal, therefore, commands this age—the Age of Coal.

Coal in truth stands not beside but entirely above all other commodities. It is the material energy of the country—the universal aid—the factor in everything we do. With coal almost any feat is possible or easy; without it we are thrown back into the laborious poverty of early times.

…

Th[e] question concerning the duration of our present cheap supplies of coal cannot but excite deep interest and anxiety wherever or whenever it is mentioned: for a little reflection will show that coal is almost the sole necessary basis of our material power, and is that, consequently, which gives efficiency to our moral and intellectual capabilities. England's manufacturing and commercial greatness, at least, is at stake in this question, nor can we be sure that material decay may not involve us in moral and intellectual retrogression.

…

[I]f it shall seem that this is not to last indefinitely—that some of our latest determinations of policy lead directly to the exhaustion of our main wealth—the letting down of our mainspring—I know not how to express the difficulty of the moral and political questions which will arise. Some will wish to hold to our adopted principles, and leave commerce and the consumption of coal unchecked even to the last; while others, subordinating commerce to purposes of a higher nature, will tend to the prohibition of coal exports, the restriction of trade, and the adoption of every means of sparing the fuel which makes our welfare and supports our influence upon the nations of the world.

This is a question of that almost religious importance which needs the separate study and determination of every intelligent person. …

<u>Chapter 7: Of the Economy of Fuel</u>

IT is very commonly urged, that the failing supply of coal will be met by new modes of using it efficiently and economically. The amount of useful work got out of coal may be made to increase manifold, while the amount of coal consumed is stationary or diminishing. We have thus, it is supposed, the means of completely neutralizing the evils of scarce and costly fuel.

…

But the economy of coal in manufactures is a different matter. *It is wholly a confusion of ideas to suppose that the economical use of fuel is equivalent to a diminished consumption. The very contrary is the truth.*

As a rule, new modes of economy will lead to an increase of consumption according to a principle recognised in many parallel instances. The economy of labour effected by the introduction of new machinery throws labourers out of employment for the moment. But such is the increased demand for the cheapened products, that eventually the sphere of employment is greatly widened. Often the very labourers whose labour is saved find their more efficient labour more demanded than before. Seamstresses, for instance, have perhaps in no case been injured, but have often gained wages before unthought of, by the use of the sewing-machine, for which we are so much indebted to American inventors.

So it is a familiar rule of finance that the reduction of taxes and tolls leads to increased gross and sometimes even net revenues; and it is a maxim of trade, that a low rate of profits, with the multiplied business it begets, is more profitable than a small business at a high rate of profit.

Now the same principles apply, with even greater force and distinctness, to the use of such a general agent as coal. It is the very economy of its use which leads to its extensive consumption. It has been so in the past, and it will be so in the future. Nor is it difficult to see how this paradox arises.

…

For the present our cheap supplies of coal, and our skill in its employment, and the freedom of our commerce with other wide lands, render us independent of the limited agricultural area of these islands, and take us out of the scope of Malthus' doctrine. We are growing rich and numerous upon a source of wealth of which the fertility does not yet apparently decrease with our demands upon it. Hence the uniform and extraordinary rate of growth which this country presents. We are like settlers spreading in a rich new country of which the boundaries are yet unknown and unfelt.

But then I must point out the painful fact that such a rate of growth will before long render our consumption of coal comparable with the total supply. In the increasing depth and difficulty of coal mining we shall meet that vague, but inevitable boundary that will stop our progress. We shall begin as it were to see the further shore of our Black Indies. The wave of population will break upon that shore, and roll back upon itself. And as settlers, unable to choose in the far inland new and virgin soil of unexceeded fertility, will fall back upon that which is next best, and will advance their tillage up the mountain side, so we, unable to discover new coal-fields as shallow as before, must deepen our mines with pain and cost.

There is too this most serious difference to be noted. A farm, however far pushed, will under proper cultivation continue to yield for ever a constant crop. But in a mine there is no reproduction, and the produce once pushed to the utmost will soon begin to fail and sink towards zero.

So far then as our wealth and progress depend upon the superior command of coal we must not only stop—we must go back.

Chapter 18: Concluding Reflections

MY work is completed in pointing out the necessary results of our present rapid multiplication when brought into comparison with a fixed amount of material resources. The social and political consequences to ourselves and to the world of a partial exhaustion of our mines are of an infinitely higher degree of uncertainty than the event itself, and cannot be made the subject of argument. But feeling as we must do that they will be of an untoward character, it is impossible to close without a few further remarks upon the truly solemn question—Are we wise in allowing the commerce of this country to rise beyond the point at which we can long maintain it?

To say the simple truth, will it not appear evident, soon after the final adoption of Free Trade principles, that our own resources are just those to which such principles ought to be applied last and most cautiously ? To part in trade with the surplus yearly interest of the soil may be unalloyed gain, but to disperse so lavishly the cream of our mineral wealth is to be spendthrifts of our capital—to part with that which will never come back.

…

The alternatives before us are simple. Our empire and race already comprise one-fifth of the world's population; and by our plantation of new states, by our guardianship of the seas, by our penetrating commerce, by the example of our just laws and firm constitution, and above all by the dissemination of our new arts, we stimulate the progress of mankind in a degree not to be measured. If we lavishly and boldly push forward in the creation and distribution of our riches, it is hard to over-estimate the pitch of beneficial influence to which we may attain in the present. *But the maintenance of such a position is physically impossible. We have to make the momentous choice between brief greatness and longer continued mediocrity.*