

Marshall on 'Machinery and Life'

1. The notes here reproduced are the outlines of a lecture delivered by Marshall at the Cambridge Nonconformists' Union on October the 20th 1901, according to his own annotation on the front page.

Leaving aside the opening statement of the liberal principle - which may still be of some use, at least in Italian politics - their main interest lies in the light they throw on Marshall's notion of progress and its dangers. Throughout his life he was a firm believer in social progress and shared with most of his contemporaries a strong faith that modern societies were experiencing something different from random movement and that progress, as this something was to be called,¹ could be conceived, analysed and promoted.² He felt that the Western world was progressing toward higher standards of life, with greater individual freedom and wealth, more evenly distributed opportunities and clear signs of advancement in private and public morality. This was a view he championed in direct opposition to any glorification of the past, substantiating it with statistics as well as psychological explanations of benevolent attitudes to the past.³

In this firm belief he was a man of the Nineteenth century, at one with Mill and Marx, though less radical than both of them. While widely differing in the extension and contents of their plans, these three giant social thinkers thought it possible, and necessary, to look at the direction of social evolution and contribute to shaping its future outcomes. In contrast, as an instance of the break which took place later on, we may recall Keynes, who followed Marshall in most of his views of the economy and the social system, but lost his faith in the possibility of telescopic glances into the future.⁴

If we inquire as to what progress meant to Marshall, we find further motives that reinforce these comparisons: like Mill and Marx he was a faithful 'democratic' thinker, once again in contrast to the 'elitist' stance that brought Keynes to see the history of society as a casual succession of spells of civilisation produced by those few - artists, scientists and politicians - who, in rare circumstances, had the possibility of leaving their trace in the world. In Marshall's view, the test of progress was the intellectual and moral standing of the common people: a progressive society was one in which the number of men sacrificed to productive and social exigencies was diminishing and the opportunities for exercising responsibility and freedom in work and leisure time were increasing for the common people. This 'humanistic' and 'democratic' view of progress, that induced him to conceive of a society in which every man was a 'gentleman' and every woman a 'lady',⁵ is here cautiously expressed in the statement

1. 'When we speak of progress we do not mean only the moving from one position to another, we do not mean any change that comes with the progress of time'. 'Lecture Notes on Mill's book IV. Course of Lectures on Economic Progress'; *Marshall Papers*, Marshall Library of Economics.

2. *Memorials of Alfred Marshall*, ed. A. C. Pigou, London, Macmillan, 1924, pp. 115-16.

3. Cf. G. J. Stigler, 'Three Lectures on Progress and Poverty', *Journal of Law and Economics*, 1969 (12), pp. 181-226; reprint in *Alfred Marshall. Critical Assessments*, ed. by J. C. Wood, 4 vols., London, Croom Helm, iv, pp. 146-92, (pp. 150-fll. in particular).

4. However, Keynes's attitude is not completely absorbed by the present as he would have us believe: here and there, he too envisages that radiant futures will be attained.

5. See 'The Future of the Working Classes', in *Memorials*.

that, although 'it is true that the nation is greater than the individual', 'it can never be much greater' (13).⁶ In other writings Marshall more openly endorsed an historical view reminiscent of the republican tradition: his models of civilisation were 'the small republics of ancient Greece and mediaeval Europe' - Athens and Florence in particular⁷ - whose modern equivalent were the English trade unions,⁸ America, with its diffused spirit of subjective freedom⁹ and the English people of sturdy archers turned artisans through the refining influence of Huguenot immigrants.¹⁰ To his mind, individual greatness was the random product of social circumstances more than of hereditary genius. The loss caused to society by any organization which sacrificed most men to production was precisely the lost opportunity of cultivating their 'latent ability' or 'faculties'.¹¹ Individual differences certainly existed, he recognized, but their social distribution was more random than could be expected and the lower classes had their share of genius whose emergence was hindered by lack of education and opportunities. Although there had been, and there could still be, advancing societies where social rigidity prevented the lower classes from moving out of their position, in the long run they were doomed to stagnate.¹² Only where individual initiative is widespread could progress be steady and continuous.

These 'humanistic' concerns appear to clash with his well-known Spencerian view of social progress as a double move toward greater differentiation and integration, or specialization and coordination.¹³ This rule governing any complex organization embodies one of Babbage's principles: the more divided are the social functions, the larger are the benefits of specialization. The needs of social coordination require an increase in social discipline: men must be bound to the performance of well-defined and repetitive tasks in which they specialize to achieve greater productive results. While the man-centered view of progress stresses individual initiative, freedom, variation and innovative creation, the organizational view underlines the functions of acquired and well-trained automatisms and orderly behaviour.

Can these views be reconciled? Are order and creativity compatible? This appears to be one of Marshall's everlasting concerns that continuously generates new related questions, such as how far technical education should be allowed to burden the human mind; how much the tendency toward business concentration is to be allowed to work unopposed and sweep away independent centers of choice and how far the immediate efficiency of centralized structures is to be preferred to the lively noise of market competition.

The first point to be stressed in order to understand Marshall's thoughts on progress is that the existence of tensions between order and creativity does not imply that they are alternative to each other. On the contrary, they are most often complementary as the first

6. This and following quotations from the reproduced text are accompanied by the indication of the page number in the original.

7. *Memorials*, p. 343.

8. J. K. Whitaker (ed.), *The Early Economic Writings of Alfred Marshall*, 2 vols., London, Macmillan, 1975, ii, p. 364.

9. See *Early Economic Writings*, ii, pp. 375-77.

10. A. Marshall, *Principles of Economics*, ninth (variorum) edition, ed. C. Guillebaud, 2 vols., London, Macmillan, 1961, i, 740; A. Marshall, *Industry and Trade*, London, Macmillan, 1919, pp. 35 and 56.

11. This is one of Marshall's favourite expressions to convey the idea of man's progressive nature. See for example *Memorials*, p. 255. Interesting comments on the concept are to be found in J. D. Chasse, 'Marshall, the Human Agent and Economic Growth: Wants and Activities Revisited', *History of Political Economy*, 1984 (16), pp. 381-404. This article provides a convincing critique of Parsons's interpretation of Marshall's social philosophy.

12. See his reflections on the evolutionary importance and the present and potential future disadvantages of the caste system in *Principles*, i, pp. 244-46.

13. Cf., for example, *Principles*, vol. I, IV.viii.1.

supports the latter. This is more easily understood by focusing on Marshall's ideas concerning the working of the human mind; for it too is capable of progress and indeed its progress is the ground and prototype of any social progress. Mental progress is achieved through the working of psychological mechanisms which connect order and creativity in a way that society as a whole replicates on a larger scale. Development of the mind implies a continuous accumulation of automatisms accompanied by growing ability to recombine and use them. A naked mind, unburdened by repetitive behavioural patterns, is unassisted in its performance. Its absolute freedom is no better than the freedom of movement of a baby confined in his cradle who has to exercise it to learn to crawl before he can enjoy discovering objects in his room. Real freedom presupposes a great asset of automatic and orderly mental connections that can be rearranged to perform new tasks. Free will, in its idealistic, absolute meaning, is an empty word as worldly freedom depends on the existence of such automatic mechanisms. It is only thanks to them that the human mind is capable of facing new and more complex situations and therefore is genuinely free.

The growth of mental structures is the equivalent in the individual of the social process of differentiation and integration. Sections of the nervous circuits are trained to perform specific tasks while the higher centers are free to concentrate their attention on new problems that defy any routine solution. In any circumstance, most of the aspects of human thinking and acting *must* be taken for granted and it is only by using these bound regularities that man can exercise free choice.

Viceversa, liberty is the source of new order and progress because it is only thanks to the power of variation that new automatisms can be generated: innovative mental connections, when useful, are recorded, preserved and re-used in analogous future circumstances.¹⁴

The second point to be underlined is that this symbiotic relation between order and creativity does not dismiss the eventuality that they could clash. When automatisms outgrow the capacity of the mind they devour all its available energy. Marshall's instances of this phenomenon are frequent and various. They range from excessive 'accumulation of knowledge [which] stunts rather than educates the mind'¹⁵ to overwork in Taylor's system, where the mind has no rest and therefore no opportunity of exercising freedom.¹⁶ In these cases automatisms hinder creative work instead of making it possible. The mind can be trapped and absorbed by too many routine engagements that leave no room for the exercise of freedom.

2. The title of the 1901 lecture, *Machinery and life*, is a different wording of the same dialectic approach to progress. Machinery is the equivalent of orderly automatisms. Significantly, Marshall compares 'material machinery' to 'machinery of thought', that is 'organized knowledge' (5): both are economical, efficient and cumulative; both save labour and contribute to world wealth. This analogy is not surprising, as machines are a product of those automatisms that characterize the progress of human knowledge. As he writes in *Principles*, following Babbage's footprints,

'when the action has been reduced to routine it has nearly arrived at the stage at which it can be taken over by machinery'.¹⁷

For this very reason, mechanical appliances are also the best hope that progress can be extended to the humbler classes by replacing their routine work and 'acting as slaves for them'.

14. These views are clearly expressed in Marshall's early work *Ye Machine*, now in T. Raffaelli, 'The Early Philosophical Writings of Alfred Marshall', *History of Economic Thought and Methodology, Archival Supplement*, 1994 (4), pp. 53-159.

15. *Industry and Trade*, p. 96.

16. *Ibidem*, p. 388.

17. *Principles*, i, p. 254.

18. *Industry and Trade*, p. 663.

If machinery is the materialization of mental order, life is almost the equivalent of individual liberty and spontaneity.

The stage is set for the interplay of these two poles. On the one hand

'all progress is the development of order [and] a uniform method is the highest order' (1).

On the other hand order and liberty are opposed to each other:

'order v liberty		
machinery		subserve
&		life' (1).
mechanical methods		deaden at

Therefore, there is 'a kernel of truth in notion *Order is an evil*' (2). This general notion is valid in all the aspects of human life which run the risk of being overburdened by material and mental machinery alike:

'Learning is like furniture
an evil if it is not a positive good' (8).

'Too much time in preparation	too little time in action
Too much scaffolding	too little building
Too much machinery	too little life' (10).

Against these dangerous tendencies, Marshall claims the rights of human life and liberty. The main task is to safeguard man from such dangerous 'aids' to life:

'Let ... [man] not block up his mind and overburden his life with machinery which he is not likely to turn to account for well being of world or own higher life' (8).

To summarize these Marshallian views, progress of the individual is a balanced growth of automatism whose daily management does not consume too much of the fresh mental energy which is needed for creative work. Progress is order, but order hinders progress when it develops on its own, irrespective of its uses in promoting human liberty and life.

Marshall knows the advantages related to the growth of unconscious, repetitive spheres of thought and activity and does not aim at absolute transparency in human affairs; indeed he warns that such a craving would be dangerously prone to breaking those routines that make higher life possible,¹⁹ namely automatism which, though involving part of human life, may be 'a means to a greater good' (12). This involvement with the reign of necessity is unavoidable; human choice and liberty are conditioned and man must face 'even some partial loss to his own individuality', provided it is turned to account for the 'well being of world or his own higher life' (8).

This view of man has immediate reverberations on issues of social order and liberty and Marshall's quick transition from mind to society is a clear sign of the common nature he perceives in their dynamics and progress. It invites us to consider the similar transition at the beginning of chapter IX of book IV of *Principles* as something more than a metaphor.²⁰ Indeed, the valuation of social dynamics itself depends on the mental processes thereby

19. This is one of the main reasons for his opposition to socialism, whose iconoclasm could but lead to 'military despotism' (*Industry and Trade*, p. 660).

20. See G. Becattini, 'External Economies', entry of *The New Palgrave. A Dictionary of Economics*, 1987 and T. Raffaelli, 'The Analysis of the Human Mind in the Early Marshallian Manuscripts', *Quaderni di Storia dell'Economia Politica*, 1991 (9), pp. 29-58.

promoted or hindered. Marshall's opinions on such different phenomena as socialism, trade unionism, state intervention, education, division of labour and business concentration bear the hallmark of this approach.

In the following notes Marshall chooses two examples from the economy where the dangers of excessive order are manifest, whatever 'the enlightened social despots' may think (12). 'Big mechanically organized businesses' and 'collective agreements' are both necessary, but necessary evils as they impose rigid order on humanity and tend to weaken its potential for variation and innovative creation.

Marshall expressed his feelings on collective bargaining in the correspondence with Caird in december 1897: the main problem, he stated, was

'[to] prevent the use of collective bargaining as a means of hindering new men and new machines from coming into work for which they are needed'.²¹

On business concentration and its state-socialist outcome he had quarrelled with Beatrice Potter earlier that year, expressing his unqualified dislike, the dislike of an 'idealist anarchist', for 'the bureaucracy of the great industrial machine'.²²

These feelings of discontent towards two cornerstones of corporate capitalism are here united through their common effects of hindering variation and liberty: no doubt in this text Marshall is far from expressing the enthusiasm towards the 'corporate liberal version of the market' that Biagini attributes to him.²³

Another example of excessive discipline is 'training', or specialized education:

'Training ... except in so far as it will be used in mental life [is] an evil to the individual who has it' (6)

The disadvantages of an early technical education are considered by Marshall to be related to the rigidity of excessively specialized training. While general education is a kind of liquid capital that can be put to different uses, technical education is fixed and prone to become useless very soon in societies where techniques are continuously changing.²⁴ Schools imparting notions are useful to industrial societies, as proved by 'Germany's zeal for solid education' that 'laid the foundation of her industrial progress';²⁵ but the German system is very defective as it does not foster spontaneity.²⁶

3. These notes, however, are remarkable also from wider perspectives on social progress. In most of his writings, as we have seen, Marshall appears to be confident in its redeeming effects because routines, once automatized, can be transferred to mechanical appliances. This is certainly Marshall's overall view and explains why progress is possible, cumulative and synonymous with order; but these notes strike a less optimistic chord and warn us that the conflict between liberty and necessity, creativity and order or, according to their title, life and machinery, will never be resolved once and for all. The perspective is far-removed from the optimistic Spencerian view of a future perfect adaptation of man to his

21. Marshall to E. Caird, 15.12.1897, Addendum; *Memorials*, p. 401.

22. *The Diary of Beatrice Webb*, vol. II, (1892-1905), ed. N. and J. Mackenzie, Cambridge Mass., Harvard University Press, p. 109.

23. See E. F. Biagini, 'The Anglican Ethics and the Spirit of Citizenship', introduction to *Alfred Marshall's Lectures to Women*, ed. E. F. Biagini, R. McWilliams Tullberg and T. Raffaelli, E. Elgar, Aldershot, 1995 (forthcoming).

24. On the importance of general education see *Principles*, i, pp. 206-08, 258-59 and 572-73. See also his paper on American industry in *Early Economic Writings*, ii (in particular pp. 360-61).

25. *Industry and Trade*, I.vii.4.

26. *Ibidem*, p. 129; cf. also p. 96.

environment. Modern man has been made much more powerful by the amount of 'machinery' of any kind at his disposal, but there is no guarantee that he will be able to command it instead of becoming its servant:

'we have too many commodities and become their servants' (9).

Something more than the growth of 'machinery' is necessary for progress in human life and this something does not occur automatically.

In general, Marshall contrasts liberty and life with man's sacrifice to production: it is so with his view of the caste system and with division of labour. Looked at from this point of view, liberty means the opening of new possibilities and implies that human beings are not subdued to social machinery. Elsewhere I have insisted on this meaning of liberty in Marshall. Here, however, we are confronted with the fact that not all the uses of this liberty are of the same kind. The dangers against which to arm the middle-class audience of the Nonconformists' Union are those of a weak will, of letting one's existence go instead of driving one's own forces to some noble purpose. Liberty may be wasted in 'gossip', squandered in pursuing fashion of both thought and dress.²⁷

While machinery is a powerful tool to overcome the dangers of repetitive labour and emancipate the working classes from their submission to productive exigencies, it has no power against weakness of the will. On the contrary, it encourages this weakness by giving it further scope. Marshall's hopes and his optimistic mood are related to his belief that the working classes will be able to turn to account their free time and revenue. His defence of the working classes against charges of being inclined to drink and tobacco is an essential element of his 'democratic' view of progress. But in these notes Marshall the preacher introduces insights into a leisurely life where liberty is sterilized by absence of 'character' and men are induced to waste their time in amusements and attempts to be up to date (9). These behavioural patterns are more difficult to eradicate than alcoholism: it looks easier to educate the working classes to become middle classes than to prevent the latter from plunging into moral weakness.

While new possibilities are almost a necessary outcome of progress and the first steps in the proper uses of this liberty are easily acquired, from a certain point onwards character - that is, power to use this liberty in a noble way - is no automatic consequence of progress. To make *some* use of liberty, to keep the mind engaged and experience the 'pleasures of the chase', is not enough. The relevant question is an *ought* irreducible to any *is*: to pursue *right* objectives, but it is also interesting to notice that, even while preaching, Marshall considered moral education in the light of his scientific view of man. Thus far, however, non-utilitarian and even non-evolutionary influences are clearly present in Marshall's ethical thought and his nature as a preacher heralds critiques of consumerism and the loss of values that is taking root in middle-class circles, among pioneering explorers of an affluent and leisure society.²⁸

27. For Marshall's critical attitude to the 'baneful influence' of fashion and the 'evil dominion' of its 'wanton vagaries' see *Principles*, i, pp. 288 and 88.

28. This problematic attitude to material progress is for once similar to Keynes's concern for man's 'nervous breakdown' in such a society, though his answer to the problem was less rigid than Marshall's and did not burden man's moral character with the same difficult tasks (cf. 'The Economic Possibilities for our Grandchildren', in J. M. Keynes, *Essays in Persuasion*, London, Macmillan, 1972, *The Collected Writings of John Maynard Keynes*, 30 vols., ix, p. 327).

Marshall's text

Machinery and Life²⁹

Nonconformists' Union 20.10.01.

(1)

Liberal:

Minority yield to majority

No: Minority not dom[inate] majority ever

Majority not dom[inate] minority often

"All progress is the development of order. A uniform method is the highest order"

→ order v liberty

machinery		subserve		life
&				
mechanical methods		deaden at		

Ask you to consider ~~partial~~ attempt at partial solution

(2)

I believe we have too much machinery, because we do not sufficiently consider to what uses it is appropriate

Reaction Civilization its cause and cure.

But I submit kernel of truth in notion Order is an evil

Supplement. A necessary evil in its place. Find its place

(3)³⁰

Guiding lines from material machinery

A. Use of machinery does not involve necessarily mechanical method.

Swimming → yachting

hand - spade - plough - cultivator

right order for little >detailed< work

inverse for great >much< massive >production<

29. *Marshall Papers*, file n. 4 (formerly Red Box 1). I thank the Marshall Library of Economics for permission to publish this text. Words crossed through were cancelled by Marshall; words inserted by Marshall either to substitute or integrate the first draft are enclosed between the signs > <. Square brackets are used for editorial additions. Page numbers in the original are reproduced at the beginning of each page inside round brackets.

30. From this page to page (10) numbers in the original were cancelled, replaced with others and then brought back to the first version. The solution adopted by Marshall at a certain stage, and then abandoned, was to insert here pages (9) and (10) and shift pages (3)-(8) to pages (5)-(10). From page (11) onwards the numbers were never changed.

(4)

eloth >Spinning< weaving.

: heavy wood work

Things that man can't do.

Chairs: Gröden horses

One stage: when a thing needs to be done by on a large scale, save muscles and nerves, and use machines.

The time sand may be used so as to get far more life out of it than >from< the 24 hours unaided by machinery.

(5)

Also mechanical progress is world wealth: cumulative.

Instinct, eam dies with owner

→ Machinery of thought is >organized knowledge and especially< Science: and like material Machinery is economical, efficient, saves labour, world-wealth, cumulative.

(6)

Also some athletic training and ∴³¹ life in learning. Sei

~~B³²ex~~ But except for that training; and except in so far as it will be used in mental life an evil to the individual who has it.

What solution?

~~To learn, beyond a little, is prima facie a risk~~

(7)

What conclusion?

A Material Machinery.

~~Buy~~ >Let us buy< few things: Let implements food etc be made by machinery but live with human beings and have your companions made by hand.

B Study.

Learning is like furniture

an evil if it is not a positive good.

(8)

Training is training: >but beyond<

Let us each choose the way in which he will be a useful implement to the world. To that end let him have all the mechanical aid he can, even to the partial loss of his own individuality.

~~Let~~ But let him not ~~fh~~ >block< up his mind and overburden his life with machinery which he is not likely to turn to account >for well being of world or own higher life<.

(9)

31. This is a mathematical sign that stands for 'therefore' and is often used by Marshall in his drafts.

32. This could be related to A on page (3).

~~for the well-being of the world or for his own higher life.~~

~~Neglect of this rule the seed³³ >cause< of nearly all that is evil in modern civilization.~~

We have too many commodities and become their servants.

Too many amusements, many exhaustive

Too many things to think about

Afraid of saying I don't know

Afraid of not being up to date

So learn many things that are useless.

(10)

We read newspapers f not as only as means to our life: ~~but~~ not so as to make us think, but for gossip.

Altogether

Too much time in preparation too little time in action

Too much scaffolding too little building

Too much machinery too little life.

(11)

Turning back to social order and liberty. The political terror is mainly over:
the ~~social and~~ economic is above us.

Big mechanically organized businesses are necessary and must have an ever greater scope. Railways.

A necessary evil

(12)

Collective agreements are necessary: but they are apt to become an evil.

The common rule which is the fashionable fetish of the modern enlightened social despots has its uses; though the closer they are examined the smaller they appear. But it is an evil: to be accepted only as a means to a greater good. **Onus probandi**

(13)

How far, is difficult to say.

Study needed. Great responsibility of this generation.

It is true that the nation is greater than the individual: that its life is more than the mere sum of the lives of the individuals in it. But it can never be much greater.

(14)

No great nation can be made of the individuals who go to London at nine to be parts of the great machine there: if their minimum wages could be raised 50% ~~but would not~~ by means that further impaired their individuality, that would not add 1% to life and real well being.

33. The word 'seed' is crossed through and substituted with 'cause' before cancellation of the whole passage.

(15)

This then is our responsibility

If we make use of our opportunities to become in a superior way up to date and mechanical others with less opportunities will become more and more up to date and devoid of life.

(16)

But if we use machinery as a means, burdening our life with nothing which does not make for life > and using it unselfishly as ~~an~~ individuals and as a nation< then we may rise again to be ~~admired~~ >the leaders of others< and to be loved by others.

We have greater opportunities than any other nation; and the British Empire may yet become the proudest pair of words the world has known.