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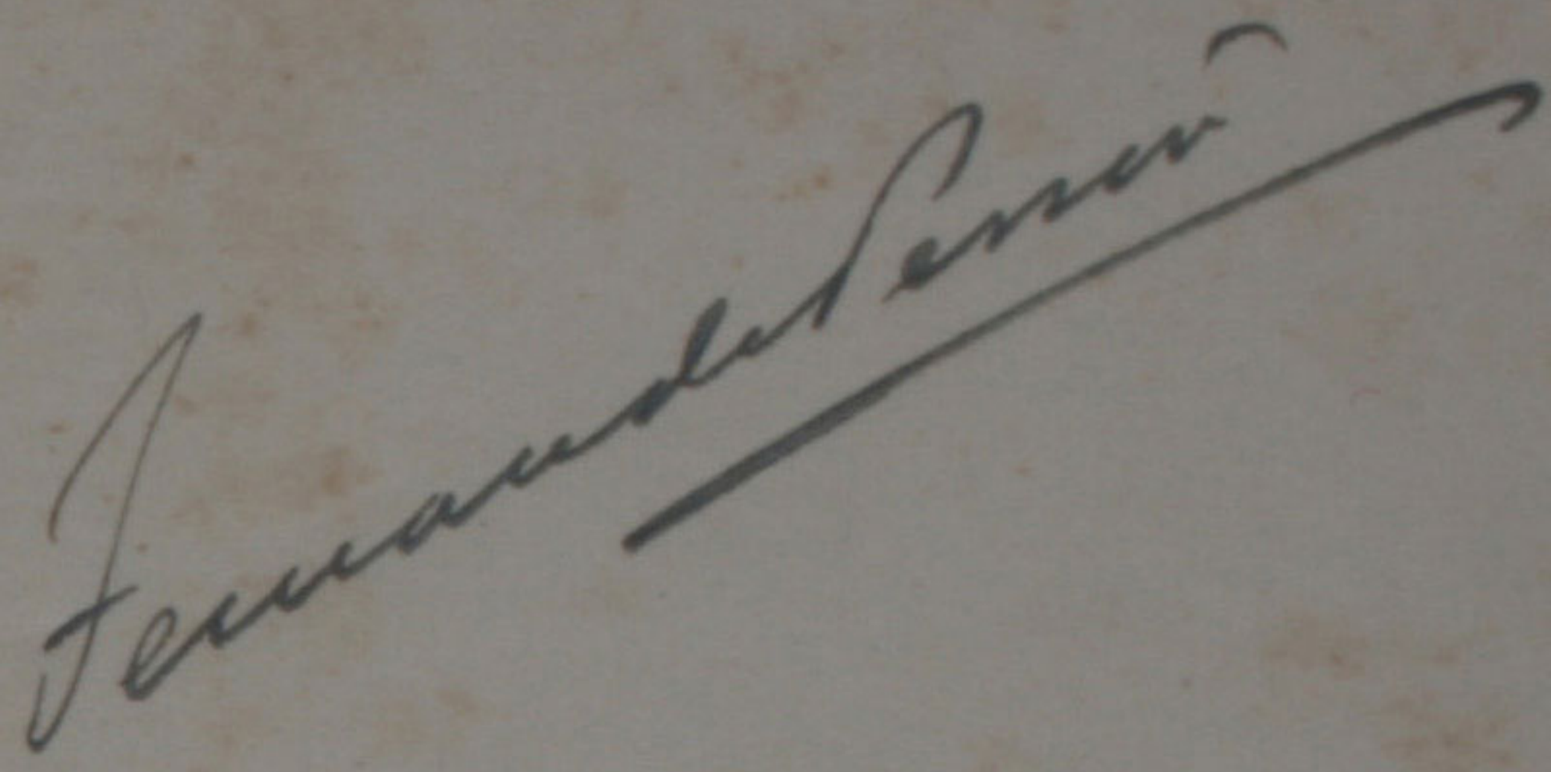

ANTICIPATIONS

ANTICIPATIONS

OF THE REACTION OF MECHANICAL AND SCIENTIFIC PROGRESS UPON HUMAN LIFE AND THOUGHT

BY

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"LOVE AND MR. LEWISHAM," "THE ISLAND OF DR. MOREAU,"
AND "TALES OF SPACE AND TIME."

NEW AND CHEAPER EDITION

WITH AUTHOR'S SPECIALLY-WRITTEN INTRODUCTION

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AN INTRODUCTION TO THE 1914 EDITION

It is now nearly fifteen years since *Anticipations* was written, and it is with a certain detachment and curiosity that I have read it over again to consider very seriously whether the issue of a fresh edition is justifiable. I have looked at the book only very occasionally since its first publication, I have never read it through since I passed the proofs for press until the present occasion, and on the whole I am surprised to find how little there is in it that I would change were I to rewrite it at the present time. It is a better book than I have been in the habit of thinking it was, and whatever the value of both of them to the world at large may be, the H. G. Wells of thirty-three has little to be ashamed of in presenting his book to the criticisms of the H. G. Wells of forty-eight. There are places, as I will presently indicate, which the latter, with some advantages of travel and experience, may be inclined to consider a little thin; there are ignorances and there are several rash and harsh generalizations; but an occasional trick of

harshness and moments of leaping ignorance are in the blood of H. G. Wells; everybody who reads him has to stand that—he has to stand it himself more than any one—and forty-eight has, I fear, but little reason on that score for a superior attitude to thirty-three. It is like a lisp or an ugly voice. On the whole, and that is the astonishing thing, the book stands; there are places when you might very well think the writer was writing about the present instead of lunging boldly into what was then the future; and it may even be that in checking its forecasts by accomplishment, the reader will find an interest that his predecessor at the beginning of the century necessarily lacked.

Remember that the book was written during the Boer War, and before the complete publication of the 1901 census returns. Since then not only these but the returns of 1911 have come to hand to confirm very thoroughly the anticipations of urban extension, of social segregation and of the altering weight of classes that constitutes the opening chapters. All that has worked out very satisfactorily, so that even quite detailed prophecies have been confirmed, such as the disappearance of literary "Boomsters" (p. 139), and the rot of the press and the appearance of smaller newspapers (compare the *Standard* and the *Daily Herald* with the considerations on page 163). And further on a considerable claim for verification may be based upon the estimate of Russia's

power, made five years before the revolt of Moscow and the war with Japan. The whole of that chapter, the Larger Synthesis, has stood the wear of fourteen years remarkably well. For the most part it might have been written yesterday. But on the other hand, there are undeniable failures. Those specialized roads for motors, for example, and particularly the one that was to run from London to Brighton, do not materialize, and the book displays a remarkable want of confidence in the immediate practicability of either flying machines or submarines. Almost everyone who reads this book now will laugh at my timid little bladder-assisted aeroplanes, and yet, in 1901, I was considered a very extravagant young man. "Long before 2000, and very probably before 1950, a successful aeroplane" —the boldness of it! The very stalest part of *Anticipations* are the anticipations of aerial war. But the laugh in that matter is more against me than the uninformed would believe, for even as I wrote these hesitating words, there lay in the bureau at which I wrote a pile of notes upon aviation, which a certain young soldier had confided to my keeping before he went to South Africa. He had come to me because I, at any rate, did not "think the whole blessed thing idiotic." If he came back I was to return them to him, it was his secret and he would go on with it; if he was killed I was to get them published. And now the Dunne self-balancing aeroplane defies the gales, and the other day, by Captain Dunne's kindness,

I was soaring three thousand feet over the town of Sheerness.

The stuff about the "New Republic," and the attempt to define the social classes of the new age, is, I think, the most permanently valuable part of this book. The general idea of the "New Republic," the onslaught on "Democracy," the manifest dislike for such partizan and particularist things as trade unionism and nationalism are as much a part of me as the intonations of my voice or the shape of my nose. That conception of an open conspiracy of intellectuals and wilful people against existing institutions and existing limitations and boundaries is always with me; it is my King Charles's head, and it forms the substance of the longest novel I have ever written—that is, if ever the war will let me get it written—the novel I am still writing. I admit that after fourteen years this open conspiracy still does not very definitely realize itself, but in that matter I have a constitutional undying patience. That open conspiracy will come. It is my faith. It is my form of political thought.

Since *Anticipations* was written I have been through the Fabian Society, and it is amusing in this moment of retrospect to recall that plunge and that tumultuous emergence. In the days when I wrote *Anticipations* I knew scarcely more of the Fabian Society than I did of the Zetetic Society, but the publication of that book and its follower *Mankind*

in the Making, brought Mr. and Mrs. Sidney Webb into my world. They appeared riding very rapidly upon bicycles, from the direction of London, offering certain criticisms of my general forecast and urging me to join and stimulate the Fabians. This extraordinary couple, so able and energetic, so devoted, so perplexingly limited, exercised me enormously. Their essential criticism of *Anticipations* was that I did not sufficiently recognize the need and probability of a specialized governing class, and they expounded to my instinctively shrinking intelligence that conception of a great bureaucracy which it has been their life-work to convey to the English intelligence. They tried to bring my New Republic within the official dimensions of their bureaucratic state while I as earnestly tried to relax their outlook to the demands of my own temperament. *A Modern Utopia* with its Samurai was the fruit of this transitory and never entirely harmonious marriage of minds, and then, recoiling as it were, I set myself with what I now perceive was an entirely exaggerated and unnecessary horror to release the Fabian Society and British Socialism from their influence. I failed scandalously after preposterous wranglings at Clifford's Inn and Essex Hall, wranglings in which Mr. Bernard Shaw somehow contrived to take a leading and entirely incomprehensible part, and which I still find too amusing to regret, and when I did at last draw breath on the further side of these discussions it

was with Mr. and Mrs. Sidney Webb beyond the reach of any ordinary apology, and a much clearer, if perhaps not materially different, conception of the underlying forces of government than those set forth in this book.

I saw then what hitherto I had merely felt that there was in the affairs of mankind something unorganized which is greater than any organization. This unorganized power is the ultimate sovereign in the world. It is a thing of the intellectual life and it is also a thing of the will. It is something transcending persons just as physical or biological science or mathematics transcends persons. It is a racial purpose to which our reason in the measure of its strength, submits us. It is what was intended when people used to talk about an Age of Reason, it was vaguely apprehended when the Victorians spoke of Public Opinion. Since writing *Anticipations* I have got into the habit of using for it the not very elegant phrase, the Collective Mind. I hope someone will soon find a better expression. This Collective Mind is essentially an extension of the spirit of science to all human affairs, its method is to seek and speak and serve the truth and to subordinate oneself to one's conception of a general purpose. Its immediate social and political effect is an insistent demand for perfect freedom of thought and discussion. Social and political order it values only as a means of freedom. But in these earlier books and until I had come

into contact with those dreams of official controls, "governing classes" and the like, in action, it is manifest how little I apprehended the danger of interference and paralysis which through the self-sufficiency of governing and managing persons any attempt to organize this collective mind involves. That chiefly is what I should alter if I were to rewrite *Anticipations* now. I should point out that the New Republic is not a type and a class of persons but *a power in men's minds and in mankind.* And that the worst enemies the Collective Mind can have, are a swarm of busy little bureaucrats professing to direct or protect it, gaining a kind of stifling control of it and working in its name. Order is a convenience, but Anarchism is the aim and outcome of that convenience. For the material securities of life indeed we want police and roads and maps and market rules, "efficiency" and government, but for the supreme things we have to abandon the methods of self-preservation and get out of cliques, Academies, securities and all associations. It is not by canvassing and committees, by tricks and violence, but by the sheer power of naked reasonableness, by propaganda and open intention, by feats and devotions of the intelligence, that the great state of the future, the world state, will come into being.

H. G. WELLS.

ANTICIPATIONS

I

Locomotion in the Twentieth Century

IT is proposed in this book to present in as orderly an arrangement as the necessarily diffused nature of the subject admits, certain speculations about the trend of present forces, speculations which, taken all together, will build up an imperfect and very hypothetical, but sincerely intended forecast of the way things will probably go in this new century.[1] Necessarily diffidence will be one of the graces of the performance. Hitherto such forecasts have been presented almost invariably in the form of fiction, and commonly the provocation of the satirical opportunity has been too much for the writer;[2]

[1] In the earlier papers, of which this is the first, attention will be given to the probable development of the civilized community in general. Afterwards these generalizations will be modified in accordance with certain broad differences of race, custom, and religion.

[2] Of quite serious forecasts and inductions of things to come, the number is very small indeed; a suggestion or so of Mr. Herbert Spencer's, Mr. Kidd's *Social Evolution*, some hints from Mr. Archdall Reid, some political forecasts, German for the most part (Hartmann's

the narrative form becomes more and more of a nuisance as the speculative inductions become sincerer, and here it will be abandoned altogether in favour of a texture of frank inquiries and arranged considerations. Our utmost aim is a rough sketch of the coming time, a prospectus, as it were, of the joint undertaking of mankind in facing these impending years. The reader is a prospective shareholder—he and his heirs—though whether he will find this anticipatory balance-sheet to his belief or liking is another matter.

For reasons that will develop themselves more clearly as these papers unfold, it is extremely convenient to begin with a speculation upon the probable developments and changes of the means of land

Earth in the Twentieth Century, e.g.), some incidental forecasts by Professor Langley (*Century Magazine*, December, 1884, e.g.), and such isolated computations as Professor Crookes' wheat warning, and the various estimates of our coal supply, make almost a complete bibliography. Of fiction, of course, there is abundance: *Stories of the Year 2000*, and *Battles of Dorking*, and the like—I learn from Mr. Peddie, the bibliographer, over one hundred pamphlets and books of that description. But from its very nature, and I am writing with the intimacy of one who has tried, fiction can never be satisfactory in this application. Fiction is necessarily concrete and definite; it permits of no open alternatives; its aim of illusion prevents a proper amplitude of demonstration, and modern prophecy should be, one submits, a branch of speculation, and should follow with all decorum the scientific method. The very form of fiction carries with it something of disavowal; indeed, very much of the Fiction of the Future pretty frankly abandons the prophetic altogether, and becomes polemical, cautionary, or idealistic, and a mere footnote and commentary to our present discontents.

locomotion during the coming decades. No one who has studied the civil history of the nineteenth century will deny how far-reaching the consequences of changes in transit may be, and no one who has studied the military performances of General Buller and General De Wet but will see that upon transport, upon locomotion, may also hang the most momentous issues of politics and war. The growth of our great cities, the rapid populating of America, the entry of China into the field of European politics are, for example, quite obviously and directly consequences of new methods of locomotion. And while so much hangs upon the development of these methods, that development is, on the other hand, a process comparatively independent, now at any rate, of most of the other great movements affected by it. It depends upon a sequence of ideas arising, and of experiments made, and upon laws of political economy, almost as inevitable as natural laws. Such great issues, supposing them to be possible, as the return of Western Europe to the Roman communion, the overthrow of the British Empire by Germany, or the inundation of Europe by the "Yellow Peril," might conceivably affect such details, let us say, as door-handles and ventilators or mileage of line, but would probably leave the essential features of the evolution of locomotion untouched. The evolution of locomotion has a purely historical relation to the Western European peoples. It is no longer

dependent upon them, or exclusively in their hands. The Malay nowadays sets out upon his pilgrimage to Mecca in an excursion steamship of iron, and the immemorial Hindoo goes a-shopping in a train, and in Japan and Australasia and America, there are plentiful hands and minds to take up the process now, even should the European let it fall.

The beginning of this twentieth century happens to coincide with a very interesting phase in that great development of means of land transit that has been the distinctive feature (speaking materially) of the nineteenth century. The nineteenth century, when it takes its place with the other centuries in the chronological charts of the future, will, if it needs a symbol, almost inevitably have as that symbol a steam engine running upon a railway. This period covers the first experiments, the first great developments, and the complete elaboration of that mode of transit, and the determination of nearly all the broad features of this century's history may be traced directly or indirectly to that process. And since an interesting light is thrown upon the new phases in land locomotion that are now beginning, it will be well to begin this forecast with a retrospect, and to revise very shortly the history of the addition of steam travel to the resources of mankind.

A curious and profitable question arises at once. How is it that the steam locomotive appeared at the time it did, and not earlier in the history of the world?

Because it was not invented. But why was it not invented? Not for want of a crowning intellect, for none of the many minds concerned in the development strikes one—as the mind of Newton, Shakespeare, or Darwin strikes one—as being that of an unprecedented man. It is not that the need for the railway and steam engine had only just arisen, and —to use one of the most egregiously wrong and misleading phrases that ever dropped from the lips of man—the demand created the supply; it was quite the other way about. There was really no urgent demand for such things at the time; the current needs of the European world seem to have been fairly well served by coach and diligence in 1800, and, on the other hand, every administrator of intelligence in the Roman and Chinese empires must have felt an urgent need for more rapid methods of transit than those at his disposal. Nor was the development of the steam locomotive the result of any sudden discovery of steam. Steam, and something of the mechanical possibilities of steam, had been known for two thousand years; it had been used for pumping water, opening doors, and working toys, before the Christian era. It may be urged that this advance was the outcome of that new and more systematic handling of knowledge initiated by Lord Bacon and sustained by the Royal Society; but this does not appear to have been the case, though no doubt the new habits of mind that spread outward from that

centre played their part. The men whose names are cardinal in the history of this development invented, for the most part, in a quite empirical way, and Trevithick's engine was running along its rails and Evan's boat was walloping up the Hudson a quarter of a century before Carnot expounded his general proposition. There were no such deductions from principles to application as occur in the story of electricity to justify our attribution of the steam engine to the scientific impulse. Nor does this particular invention seem to have been directly due to the new possibilities of reducing, shaping, and casting iron, afforded by the substitution of coal for wood in iron works; through the greater temperature afforded by a coal fire. In China coal has been used in the reduction of iron for many centuries. No doubt these new facilities did greatly help the steam engine in its invasion of the field of common life, but quite certainly they were not sufficient to set it going. It was, indeed, not one cause, but a very complex and unprecedented series of causes, that set the steam locomotive going. It was indirectly, and in another way, that the introduction of coal became the decisive factor. One peculiar condition of its production in England seems to have supplied just one ingredient that had been missing for two thousand years in the group of conditions that were necessary before the steam locomotive could appear.

This missing ingredient was a demand for some

comparatively simple, profitable machine, upon which the elementary principles of steam utilization could be worked out. If one studies Stephenson's "Rocket" in detail, as one realizes its profound complexity, one begins to understand how impossible it would have been for that structure to have come into existence *de novo*, however urgently the world had need of it. But it happened that the coal needed to replace the dwindling forests of this small and exceptionally rain-saturated country occurs in low hollow basins overlying clay, and not, as in China and the Alleghanies for example, on high-lying outcrops, that can be worked as chalk is worked in England. From this fact it followed that some quite unprecedented pumping appliances became necessary, and the thoughts of practical men were turned thereby to the long-neglected possibilities of steam. Wind was extremely inconvenient for the purpose of pumping, because in these latitudes it is inconstant: it was costly, too, because at any time the labourers might be obliged to sit at the pit's mouth for weeks together, whistling for a gale or waiting for the water to be got under again. But steam had already been used for pumping upon one or two estates in England—rather as a toy than in earnest—before the middle of the seventeenth century, and the attempt to employ it was so obvious as to be practically unavoidable.[1] The water

[1] It might have been used in the same way in Italy in the first century, had not the grandiose taste for aqueducts prevailed.

trickling into the coal measures[1] acted, therefore, like water trickling upon chemicals that have long been mixed together dry and inert. Immediately the latent reactions were set going. Savery, Newcomen, a host of other workers, culminating in Watt, working always by steps that were at least so nearly obvious as to give rise again and again to simultaneous discoveries, changed this toy of steam into a real, a commercial thing, developed a trade in pumping engines, created foundries and a new art of engineering, and almost unconscious of what they were doing, made the steam locomotive a well-nigh unavoidable consequence. At last, after a century of improvement on pumping engines, there remained nothing but the very obvious stage of getting the engine that had been developed on wheels and out upon the ways of the world.

Ever and again during the eighteenth century an engine would be put upon the roads and pronounced a failure—one monstrous Palæoferric creature was visible on a French high road as early as 1769—but by the dawn of the nineteenth century the problem had very nearly got itself solved. By 1804 Trevithick had a steam locomotive indisputably in motion and almost financially possible, and from his hands it puffed its way, slowly at first, and then, under Stephenson, faster and faster, to a transitory empire over the earth. It was a steam locomotive—but for

[1] And also into the Cornwall mines, be it noted.

all that it was primarily *a steam engine for pumping* adapted to a new end; it was a steam engine whose ancestral stage had developed under conditions that were by no means exacting in the matter of weight. And from that fact followed a consequence that has hampered railway travel and transport very greatly, and that is tolerated nowadays only through a belief in its practical necessity. The steam locomotive was all too huge and heavy for the high road—it had to be put upon rails. And so clearly linked are steam engines and railways in our minds that, in common language now, the latter implies the former. But indeed it is the result of accidental impediments, of avoidable difficulties that we travel to-day on rails.

Railway travelling is at best a compromise. The quite conceivable ideal of locomotive convenience, so far as travellers are concerned, is surely a highly mobile conveyance capable of travelling easily and swiftly to any desired point, traversing, at a reasonably controlled pace, the ordinary roads and streets, and having access for higher rates of speed and long-distance travelling to specialized ways restricted to swift traffic, and possibly furnished with guide-rails. For the collection and delivery of all sorts of perishable goods also the same system is obviously altogether superior to the existing methods. Moreover, such a system would admit of that secular progress in engines and vehicles that the stereotyped conditions of the railway have almost completely

arrested, because it would allow almost any new pattern to be put at once upon the ways without interference with the established traffic. Had such an ideal been kept in view from the first the traveller would now be able to get through his long-distance journeys at a pace of from seventy miles or more an hour without changing, and without any of the trouble, waiting, expense, and delay that arises between the household or hotel and the actual rail. It was an ideal that must have been at least possible to an intelligent person fifty years ago, and, had it been resolutely pursued, the world, instead of fumbling from compromise to compromise as it always has done and as it will do very probably for many centuries yet, might have been provided to-day, not only with an infinitely more practicable method of communication, but with one capable of a steady and continual evolution from year to year.

But there was a more obvious path of development and one immediately cheaper, and along that path went short-sighted Nineteenth Century Progress, quite heedless of the possibility of ending in a *cul-de-sac*. The first locomotives, apart from the heavy tradition of their ancestry, were, like all experimental machinery, needlessly clumsy and heavy, and their inventors, being men of insufficient faith, instead of working for lightness and smoothness of motion, took the easier course of placing them upon the tramways that were already in existence—chiefly for the transit

of heavy goods over soft roads. And from that followed a very interesting and curious result.

These tram-lines very naturally had exactly the width of an ordinary cart, a width prescribed by the strength of one horse. Few people saw in the locomotive anything but a cheap substitute for horseflesh, or found anything incongruous in letting the dimensions of a horse determine the dimensions of an engine. It mattered nothing that from the first the passenger was ridiculously cramped, hampered, and crowded in the carriage. He had always been cramped in a coach, and it would have seemed "Utopian"—a very dreadful thing indeed to our grandparents—to propose travel without cramping. By mere inertia the horse-cart gauge, the 4 ft. 8½ in. gauge, *nemine contradicente*, established itself in the world, and now everywhere the train is dwarfed to a scale that limits alike its comfort, power, and speed. Before every engine, as it were, trots the ghost of a superseded horse, refuses most resolutely to trot faster tham fifty miles an hour, and shies and threatens catastrophe at every point and curve. That fifty miles an hour, most authorities are agreed, is the limit of our speed for land travel, so far as existing conditions go.[1] Only a revolutionary reconstruction of the

[1] It might be worse. If the biggest horses had been Shetland ponies, we should be travelling now in railway carriages to hold two each side at a maximum speed of perhaps twenty miles an hour. There is hardly any reason, beyond this tradition of the horse, why the railway carriage should not be even nine or ten feet wide, the width, that is, of the