H. G. Wells on the Diffusion of Great Cities

The economic forces making for concentration of population into large cities and, later, deconcentration into suburbs, urban fringes, and satellite towns are familiar themes in economic geography, formalized in the economics of location by such theorists as Alfred Weber, August Lösch, and Walter Christaller. Abstracting from the economics, substantial insight into these processes can be gained simply by looking at transport technology and the daily commuting options thereby made possible. The passages reproduced below, from a 1901 essay by H. G. Wells, provide an early illustration of this proposition. Wells neatly spans fact and forecast to depict a spreading-out of large cities over the course of the twentieth century. Shape and extent are governed by geography and travel times, but overall population size is also constrained by what would now be termed the city's footprint. "Each great city is sustained finally by the trade and production of a certain proportion of the world's surface—by the area it commands commercially." It cannot grow beyond that limit "except as a result of some quite morbid and transitory process—to be cured at last by famine and disorder." (The ultimate sizes of the urban agglomerations Wells anticipates—ranging up to 40 million or so in population, albeit at low average densities—now look extravagant. Today's largest city, by the UN's measure, is Tokyo at 36 million and unlikely to grow further. No other city is above 20 million, although by 2025 eight are projected to reach or exceed that level. Hankou, Wells's exemplar of a great city, is not one of them. It is part of present-day Wuhan, whose current population is still below 10 million.) But in another of Wells's aperçus, technological developments are expected to steadily efface the contrast between urbanity and rusticity.

An alternative future for the great cities, more in line with the dystopias discussed elsewhere in this issue, is sketched in a later work by Wells, The World Set Free: A Story of Mankind *(1914), where the author imagines their destruction in a nuclear war breaking out in the 1950s:*

> *[U]nder the shock of the atomic bombs, the great masses of population which had gathered into the enormous, dingy town centres of that period were dispossessed and scattered*

disastrously over the surrounding rural areas. It was as if some brutal force, grown impatient at last at man's blindness, had with the deliberate intention of a rearrangement of population upon more wholesome lines, shaken the world. The great industrial regions and the large cities that had escaped the bombs were, because of their complete economic collapse, in almost as tragic a plight as those that blazed, and the countryside was disordered by a multitude of wandering and lawless strangers. . . .

In the map of nearly every country of the world three or four more red circles, a score of miles in diameter, mark the position of the dying atomic bombs and the death areas that men have been forced to abandon around them. Within these areas perished museums, cathedrals, palaces, libraries, galleries of masterpieces, and a vast accumulation of human achievement, whose charred remains lie buried, a legacy of curious material that only future generations may hope to examine.

H. G. Wells (1866–1946), a prolific writer, is best known for his science fiction, most famously The Time Machine *(1895) and* The War of the Worlds *(1898). During his life, his nonfiction, notably* The Outline of History, *was also widely read. His views on the future of social life have lasted less well than his technological forecasts, at least when not cast in wholly fictional terms. The strongly eugenicist ideas displayed in his early works, both fiction and nonfiction, were moderated and ultimately abandoned later in his life.*

The excerpt below is from "The Probable Diffusion of Great Cities," one of a series of essays by Wells that originally appeared in the Fortnightly Review *(London) during 1901, and in book form as* Anticipations of the Reaction of Mechanical and Scientific Progress upon Human Life and Thought *(London: Chapman & Hall, 1901). (The text is reproduced from the first American edition [New York: Harper & Brothers, 1902], pp. 44–54, 70–71.)*

It was always in connection with a port or navigable river that the greater towns of the pre-railway periods arose, a day's journey away from the coast when sea attack was probable, and shifting to the coast itself when that ceased to threaten. Such sea-trading handicraft-towns as Bruges, Venice, Corinth, or London were the largest towns of the vanishing order of things. Very rarely, except in China, did they clamber above a quarter of a million inhabitants, even though to some of them there was presently added court and camp. In China, however, a gigantic river and canal system, laced across plains of extraordinary fertility, has permitted the growth of several city aggregates with populations exceeding a million, and in the case of the Hankow trinity of cities exceeding five million people.

In all these cases the position and the population limit were entirely determined by the accessibility of the town and the area it could dominate for the purposes of trade. And not only were the commercial or natural towns so determined, but the political centres were also finally chosen for strategic considerations—in a word, communications. And now, perhaps, the real sig-

nificance of the previous paper,* in which sea velocities of fifty miles an hour, and land travel at the rate of a hundred, and even cab and omnibus journeys of thirty or forty miles, were shown to be possible, becomes more apparent.

At the first sight it might appear as though the result of the new developments was simply to increase the number of giant cities in the world by rendering them possible in regions where they had hitherto been impossible—concentrating the trade of vast areas in a manner that had hitherto been entirely characteristic of navigable waters. It might seem as though the state of affairs in China, in which population has been concentrated about densely congested "million-cities," with pauper masses, public charities, and a crowded struggle for existence, for many hundreds of years, was merely to be extended over the whole world. We have heard so much of the "problem of our great cities"; we have the impressive statistics of their growth; the belief in the inevitableness of yet denser and more multitudinous agglomerations in the future is so widely diffused, that at first sight it will be thought that no other motive than a wish to startle can dictate the proposition that not only will many of these railway-begotten "giant cities" reach their maximum in the commencing century, but that in all probability they, and not only they, but their water-born prototypes in the East also, are destined to such a process of dissection and diffusion as to amount almost to obliteration, so far, at least, as the blot on the map goes, within a measurable further space of years. ...

The determining factor in the appearance of great cities in the past, and, indeed, up to the present day, has been the meeting of two or more transit lines, the confluence of two or more streams of trade, and easy communication. The final limit to the size and importance of the great city has been the commercial "sphere of influence" commanded by that city, the capacity of the alluvial basin of its commerce, so to speak, the volume of its river of trade. About the meeting-point so determined the population so determined has grouped itself...in accordance with *laws that are also considerations of transit.*

The economic centre of the city is formed, of course, by the wharves and landing-places—and in the case of railway-fed cities by the termini—where passengers land and where goods are landed, stored, and distributed. Both the administrative and business community, traders, employers, clerks, and so forth, must be within a convenient access of this centre; and the families, servants, tradesmen, amusement purveyors dependent on these again must also come within a maximum distance. At a certain stage in town-growth the pressure on the more central area would become too great for habitual family life there, and an office region would differentiate from an outer region of homes. Beyond these two zones, again, those whose connection with the great city was merely intermittent would constitute a system of suburban houses and areas. But the grouping of these, also, would be determined finally

*Refers to preceding essay in *Anticipations...*, "Locomotion in the twentieth century" [ed.]

by the convenience of access to the dominant centre. That secondary centres, literary, social, political, or military, may arise about the initial trade centre, complicates the application, but does not alter the principle here stated. They must all be within striking distance. The day of twenty-four hours is an inexorable human condition, and up to the present time all intercourse and business have been broken into spells of definite duration by intervening nights. Moreover, almost all effective intercourse has involved personal presence at the point where intercourse occurs. The possibility, therefore, of going and coming and doing that day's work has hitherto fixed the extreme limits to which a city could grow, and has exacted a compactness which has always been very undesirable and which is now for the first time in the world's history no longer imperative.

So far as we can judge without a close and uncongenial scrutiny of statistics, that daily journey that has governed, and still to a very considerable extent governs, the growth of cities, has had, and probably always will have, a maximum limit of two hours, one hour each way from sleeping-place to council chamber, counter, workroom, or office-stool. And, taking this assumption as sound, we can state precisely the maximum area of various types of town. A pedestrian agglomeration such as we find in China, and such as most of the European towns probably were before the nineteenth century, would be swept entirely by a radius of four miles about the business quarter and industrial centre; and, under these circumstances, where the area of the feeding regions has been very large the massing of human beings has probably reached its extreme limit.* Of course, in the case of a navigable river, for example, the commercial centre might be elongated into a line and the circle of the city modified into an ellipse with a long diameter considerably exceeding eight miles, as, for example, in the case of Hankow.

If, now, horseflesh is brought into the problem, an outer radius of six or eight miles from the centre will define a larger area in which the carriage folk, the hackney users, the omnibus customers, and their domestics and domestic camp followers may live and still be members of the city. Towards that limit London was already probably moving at the accession of Queen Victoria, and it was clearly the absolute limit of urban growth—until locomotive mechanisms capable of more than eight miles an hour could be constructed.

And then there came suddenly the railway and the steamship, the former opening with extraordinary abruptness a series of vast through-routes for trade, the latter enormously increasing the security and economy of the traffic on the old water routes. For a time neither of these inventions was applied to the needs of intra-urban transit at all. For a time they were purely centripetal forces. They worked simply to increase the general volume of

*It is worth remarking that in 1801 the density of population in the City of London was half as dense again as that of any district, even of the densest "slum" districts to-day.

trade, to increase—that is, the pressure of population upon the urban centres. As a consequence the social history of the middle and later thirds of the nineteenth century, not simply in England but all over the civilized world, is the history of a gigantic rush of population into the magic radius of—for most people—four miles, to suffer there physical and moral disaster less acute, but, finally, far more appalling to the imagination than any famine or pestilence that ever swept the world. Well has Mr. George Gissing named nineteenth-century London in one of his great novels the "Whirlpool," the very figure for the nineteenth-century Great City, attractive, tumultuous, and spinning down to death.

But, indeed, these great cities are no permanent maëlstroms. These new forces, at present still so potently centripetal in their influence, bring with them, nevertheless, the distinct promise of a centrifugal application that may be finally equal to the complete reduction of all our present congestions. The limit of the pre-railway city was the limit of man and horse. But already that limit has been exceeded, and each day brings us nearer to the time when it will be thrust outward in every direction with an effect of enormous relief.

So far the only additions to the foot and horse of the old dispensation that have actually come into operation, are the suburban railways, which render possible an average door-to-office hour's journey of ten or a dozen miles—further only in the case of some specially favored localities. The star-shaped contour of the modern great city, thrusting out arms along every available railway line, knotted arms of which every knot marks a station, testify sufficiently to the relief of pressure thus afforded. Great Towns before this century presented rounded contours and grew as a puff-ball swells; the modern Great City looks like something that has burst an intolerable envelope and splashed. But, as our previous paper has sought to make clear, these suburban railways are the mere first rough expedient of far more convenient and rapid developments.

We are—as the census returns for 1901 quite clearly show—in the early phase of a great development of centrifugal possibilities. And since it has been shown that a city of pedestrians is inexorably limited by a radius of about four miles, and that a horse-using city may grow out to seven or eight, it follows that the available area of a city which can offer a cheap suburban journey of thirty miles an hour is a circle with a radius of thirty miles. And is it too much, therefore, in view of all that has been adduced in this and the previous paper, to expect that the available area for even the common daily toilers of the great city of the year 2000, or earlier, will have a radius very much larger even than that? Now, a circle with a radius of thirty miles gives an area of over 2800 square miles, which is almost a quarter that of Belgium. But thirty miles is only a very moderate estimate of speed, and the reader of the former paper will agree, I think, that the available area for the social equivalent of the favored season-ticket holders of today will have a radius of over one hundred

miles, and be almost equal to the area of Ireland.* The radius that will sweep the area available for such as now live in the outer suburbs will include a still vaster area. Indeed, it is not too much to say that the London citizen of the year 2000 A.D. may have a choice of nearly all England and Wales south of Nottingham and east of Exeter as his suburb, and that the vast stretch of country from Washington to Albany will be all of it "available" to the active citizen of New York and Philadelphia before that date.

This does not for a moment imply that cities of the density of our existing great cities will spread to these limits. Even if we were to suppose the increase of the populations of the great cities to go on at its present rate, this enormous extension of available area would still mean a great possibility of diffusion. But though most great cities are probably still very far from their maxima, though the network of feeding railways has still to spread over Africa and China, and though huge areas are still imperfectly productive for want of a cultivating population, yet it is well to remember that for each great city, quite irrespective of its available spaces, a maximum of population is fixed. Each great city is sustained finally by the trade and production of a certain proportion of the world's surface—by the area it commands commercially. The great city cannot grow, except as a result of some quite morbid and transitory process—to be cured at last by famine and disorder—beyond the limit the commercial capacity of that commanded area prescribes. Long before the population of this city, with its inner circle a third of the area of Belgium, rose towards the old-fashioned city density, this restriction would come in. Even if we allowed for considerable increase in the production of food stuffs in the future, it still remains inevitable that the increase of each city in the world must come at last upon arrest.

Yet, though one may find reasons for anticipating that this city will in the end overtake and surpass that one and such-like relative prophesying, it is difficult to find any data from which to infer the absolute numerical limits of these various diffused cities. Or, perhaps, it is more seemly to admit that no such data have occurred to the writer. So far as London, St. Petersburg, and Berlin go, it seems fairly safe to assume that they will go well over twenty millions; and that New York, Philadelphia, and Chicago will probably, and Hankow almost certainly, reach forty millions. Yet even forty millions over thirty-one thousand square miles of territory is, in comparison with four millions over fifty square miles, a highly diffused population. ...

And as for the world beyond our urban regions? The same line of reasoning that leads to the expectation that the city will diffuse itself until it has taken up considerable areas and many of the characteristics, the greenness, the fresh air, of what is now country, leads us to suppose also that the coun-

*Be it noted that the phrase "available area" is used, and various other modifying considerations altogether waived for the present.

try will take to itself many of the qualities of the city. The old antithesis will, indeed, cease, the boundary lines will altogether disappear; it will become, indeed, merely a question of more or less populous. There will be horticulture and agriculture going on within the "urban regions," and "urbanity" without them. Everywhere, indeed, over the land of the globe between the frozen circles, the railway and the new roads will spread, the network of communication wires and safe and convenient ways. To receive the daily paper a few hours late, to wait a day or so for goods one has ordered, will be the extreme measure of rusticity save in a few remote islands and inaccessible places.