

## CHAPTER I

*Intrinsic intelligibility*  
*Communications with Mars, and between disciplines,*  
*in the pages of the magazines*

## The Mars craze

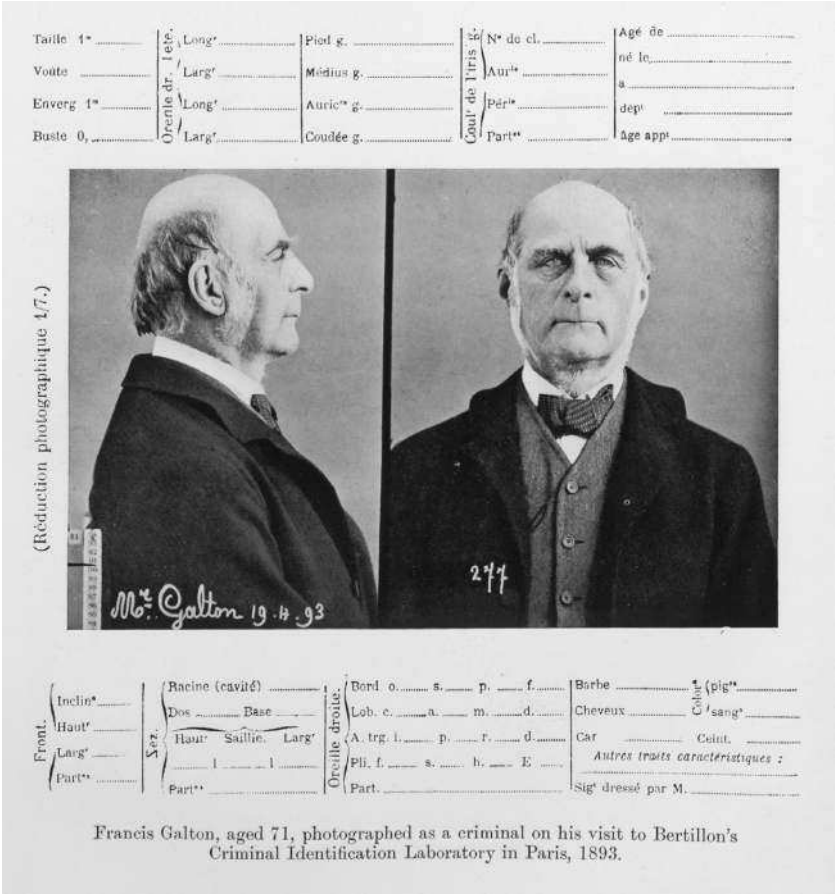
In the autumn of 1892, the Earth and Mars were in favourable opposition. The two planets “lined up” with the Sun, and a few days later passed within 60,000,000 kilometres of each other, almost as close as they ever get. On Earth, Mars would have appeared as one of the brightest objects in the night sky, easily visible to the naked eye as a blood-red star outshining everything but the Moon and Venus. It was the best view of Mars which the Victorians had seen since Schiaparelli had observed his *canali* during the favourable opposition of 1877, and it prompted much excitement in the periodical press as professionals and amateurs gazed skywards. An article in the *Pall Mall Gazette*, written three years later, makes reference to one result of the craze:

[T]here was a considerable amount of discussion as to the probability of [Mars] being ‘inhabited’. Letters appeared in the daily papers, and nearly every one had something to say on the subject, and there was even some talk of trying to attract the attention of our Martian neighbours by heliographic signals. What language was to be used, and whether the signals were to be according to the Morse, or some other code, was apparently left for astronomers to decide, but scientists declined to undertake this interesting work, and in the meantime Mars drifted away from us on his circumscribed journey through space.<sup>1</sup>

P. L. Addison, the author of this piece, captures wonderfully the correspondence between the planet’s fading from the night sky and its fading from reported popular consciousness. But in claiming that scientists had ‘declined’ to investigate the idea of communicating with the red planet, he was slightly premature. As Addison was writing, an intelligence greater than his, and yet as mortal, was hard at work on the problem.

One of the ‘letters in the daily papers’ which Addison mentions had been written by Francis Galton (1822–1911; Fig. 1.1), a man of whom it may

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1.1 Image of Francis Galton, from Karl Pearson's *The Life, Letters, and Labors of Francis Galton* (1924). Courtesy of the Cadbury Research Library, University of Birmingham.

be enough to say that he invented both eugenics and a primitive kind of bicycle odometer. Half-cousin of Charles Darwin, Galton was responsible for breakthroughs in fingerprinting, statistics, meteorology, and much besides.<sup>2</sup> As close a figure as we might hope to find to the stereotype of the polymathic Victorian inventor-scientist, he was also an enthusiastic communicator, writing prolifically for a general audience – lectures, books, and articles in periodicals. His zeal for this role was such that when he hadn't written an article, he was frequently to be found making some point or clarification on the letters page of a magazine or newspaper. His



1.2 A heliostat designed by Francis Galton. © UCL Galton Collection.

contribution to the Mars craze was a letter published in the *Times* at the height of the 1892 opposition, in which he claimed that:

With funds and good will, there seems no insuperable difficulty in [...] sending signals that the inhabitants of Mars, if they have eyes, wits, and fairly good telescopes, would speculate on and wish to answer.<sup>3</sup>

Galton had invented a hand-held version of the heliostat – a signalling device which reflects sunlight in a targeted direction – whilst travelling in Africa in his youth (Fig. 1.2). He had reported his experiences in *The Art of Travel* in 1858 and delivered a paper on heliostats to the British Association for the Advancement of Science that same year. His experience gave him some authority with which to address the possibility of using similar devices to communicate with Mars, and in his letter to the *Times* he comes to the conclusion that it should be possible to produce a signal visible at that distance, although not without difficulties:

My own method is not practicable, at least without considerable addition and modifications, as it requires the object to be visible towards which the flash is directed, but Mars is not visible to the naked eye at day.<sup>4</sup>

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This implied call for other suggestions was left unanswered, and Galton, like Addison, was compelled to watch Mars recede from the public eye. In a passage which strikingly mirrors Addison's, he was later to remark that:

[T]he craze about Mars died away; the planet ceased to be particularly conspicuous, people grew tired of the topic, and the heated thoughts of many writers were cooled by copious douches of astronomical common sense.<sup>5</sup>

Galton's interest, however, had not been completely washed away. In the draft of an unpublished letter to the *Spectator* written less than a week after his letter to the *Times*, he had proposed using algebra as the basis of a language for the heliotrope signals. '[I]t is an interesting subject and possibly worth writing a few lines about', he wrote.<sup>6</sup> In fact, he found the subject so interesting that it was still in his mind nearly four years later, in the summer of 1896, when a 'somewhat dreamy vacation' afforded him the opportunity of enlarging upon his ideas.<sup>7</sup> The eventual result of this was the publication of a short article called 'Intelligible Signals between Neighbouring Stars', which appeared in the *Fortnightly Review* for November of that year.

Although it is by no means an important work, even within the comparatively restricted scope of Galton's own output, 'Intelligible Signals' (as I shall refer to it from now on) is a fascinating piece of writing, offering a rich microcosm of the issues surrounding the periodical format's engagement with science. Fusing together locutions of several notionally distinct modes of writing, often apparently in spite of itself, the article is an excellent case study for approaching the material entanglement of genres of literature and science. This entire chapter is devoted to an analysis of Galton's piece, the aim being to explore the way in which he confounds rigorous categorisation, showing not only exchange between the supposed opposites 'science' and 'fiction' but also that each provides essential components without which the article would be incomplete; fiction and the periodical format are not merely window-dressings for a scientific idea, but reinforce the argument and subtly alter it. I will also contend that the image of two worlds hanging in an isolating vacuum is an appropriate analogy for later twentieth-century understandings of the 'Two Cultures', and that Galton's idea for a communication system between them (based on intrinsic, shared qualities) disrupts it most usefully. It does so, I will argue, not only in its own right but because of the mix of genres in the article advancing

it and the mix of interests represented by its author. In this respect, 'Intelligible Signals' is an excellent ambassador for the *fin-de-siècle* periodical.

Medium and message are identical in Galton's algebraic scheme for interplanetary signalling, which makes it significant that they are also closely allied in the article which proposes it. The idea of universal communication can therefore be enrolled to do some powerful metaphorical work in the consideration of the genre and disciplinary relationships, and it is to this end that the following close and contextual readings are ultimately directed.

### Reading 'Intelligible Signals Between Neighbouring Stars' for science, fiction, and the popular press

'Intelligible Signals' is much more the successor to Galton's unpublished *Spectator* letter than it is to the letter which appeared in the *Times*, for it focuses purely on linguistic difficulties, disregarding almost entirely the technical side of how the signals to Mars might be sent. Addison had observed in the *Pall Mall Gazette* that Morse code would be useless for an enterprise like this, since it translates only back into the language from which it was encoded (and even then, only with a key). 'Signals have to be devised', remarks Galton, at the outset of his *Fortnightly Review* article,

...that are *intrinsically* intelligible, so that the messages may be deciphered by any intelligent man, or other creature, who has made nearly as much advance in pure and applied science as ourselves.<sup>8</sup>

The puzzle which the article sets out to solve, in other words, is that any message sent to Mars must be capable of translating itself – into any language. Galton's solution rests in mathematics and geometry. Signalling numerical rudiments via a series of flashes, his code slowly increases in complexity until it is transmitting quite sophisticated maths and conveying along the way a series of characters (sets of flashes) such as ' $\pi$ ', which could eventually form the basis of pictorial communication. Galton claims that 'the reader will probably feel surprised at the unexpected simplicity' of his solution (p. 657), but a present-day observer, even one with no training in linguistics or mathematics, will almost certainly feel dubious from the start. There are a number of assumptive leaps in Galton's plan, not least the supposition that any intelligence looking at a certain set of dots, dashes, and lines will be able to infer an equals sign:

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Every line begins with one or more dots; then follows a dash; and then a word of two letters. There is one dot at the beginning of the first line, two at that of the next, and so on regularly up to the seventh. The symbols at the end of successive lines are those of the successive combinations of *dot*, *dash*, and *line*, taken in order up to the seventh; the eighth which is — —, and the ninth which is — — —, are not used. The arrangement suggests that the dash means ‘is equal to’, and that the symbols are those of numerals. . .<sup>9</sup>

A century of SF has made us good at quickly noticing some other objections. The Martians would already have to have a concept of letters, words, and line breaks before they got to something as delicate as the equals sign, for example, which is a lot to assume of a completely alien civilisation.

Criticising the scientific assumptions underpinning Galton’s proposal, though, is not my primary purpose here; I am more interested in what the article tells us about disciplinary and generic relationships in the periodical press than in what it tells us about how we might communicate with Mars. In order to definitively argue that the piece can provide insight into the relationships between literature, science, and popular culture, it is first necessary to establish that Galton was participating in all three. The work of this section is therefore to argue that ‘Intelligible Signals’ constitutes a piece of imaginative writing; that it not only exhibits the tropes of popular fiction but that they are materially entangled with (and arise in consequence of) its scientific arguments. The necessary first step here is to establish that Galton, a Fellow of the Royal Society, considered his own idea a genuine scientific proposition, regardless of how idly he formulated it and how feasible it may look to us today.

The following passage comes from later in ‘Intelligible Signals’, a point at which the signalling system has been developed to the extent that messages are being used to draw pictures as if on graph paper:

[B]oth the length of the stitch and its inclination may be specified more delicately by the help of decimals. Thus let  $j$  be the symbol for a stitch in any given direction, then  $0.5 \times j$  means a half-length stitch in the direction  $j$ . A series of 4 triangles were signalled to explain this, in which the angles corresponded exactly with certain of the rhumbs, while the sides had to be expressed with decimals.<sup>10</sup>

The tone Galton uses here is dry and measured, the voice of the lecturer. The ‘let  $x$  equal  $y$ ’ model of sentence construction remains an archetype of scientific language, and the word ‘expressed’ in this context would appear at home in a present-day maths textbook. This passage is taken from a far longer section, pretty much any of which could have been excerpted to make

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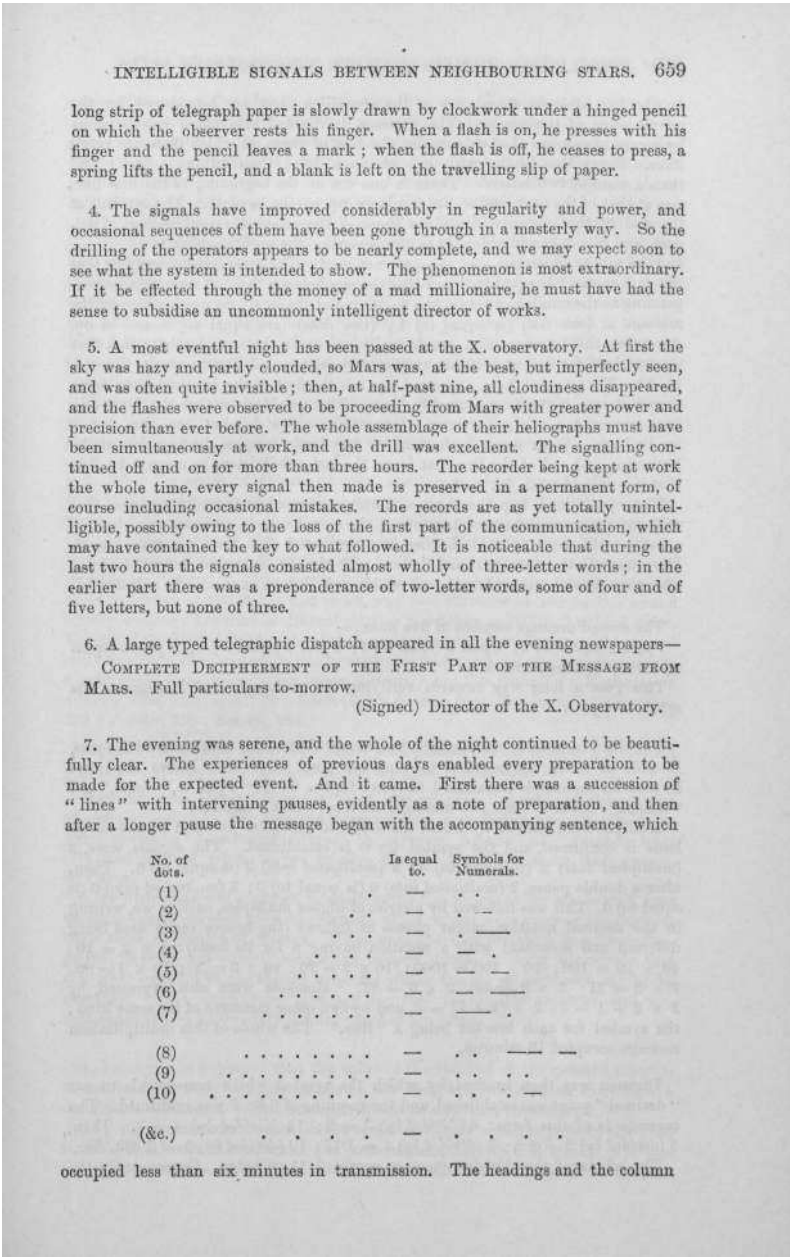
my point: Galton's language and bearing throughout the piece indicate a seriousness of purpose, and he is often at pains to underline the fact that he has thought thoroughly about his subject and is speaking with good authority. Complementing this language is his choice of the *Fortnightly Review* as the venue for the article's publication. The *Fortnightly* had been in print since 1865 with a mandate to promote independent, intelligent thought. By 1896, its relatively advanced years carried almost as much weight as the names of its contributors, and it was the first magazine to adopt signature – George Eliot, Walter Bagehot, and George Meredith had all contributed to the first volume.<sup>11</sup> Whilst it was not an avowedly science-oriented publication, the *Fortnightly* had committed itself to science in its opening manifesto, listing it as one of the six key areas in which it intended to intervene (the other five were literature, art, philosophy, finance, and politics) and it had strongly supported the evolutionists, publishing articles by T. H. Huxley and Herbert Spencer among others. Its type was set in one column across the page and carried no illustrations, printing diagrams and tables only when the subject matter strictly demanded it. A synopsis of nineteenth-century literature published in the same year as Galton's article mentions the *Fortnightly* as a publication which, despite printing some fiction, 'busied [itself] with more or less serious subjects', and the magazine typically featured a large amount of social and political commentary, with articles on 'The Cyprus Convention', 'Lord Rosebery's Resignation', and 'The Struggle Before Us' all appearing in the same issue as 'Intelligible Signals'.<sup>12</sup> Galton shared space with literary criticism too, in the form of 'Emile Verhaeren: The Belgian Poet' and 'William Morris: A Eulogy'. In short, then, the *Fortnightly* was *not* one of the Standard Illustrated Popular magazines I proposed to focus on in the introduction; Galton's choice of it suggests that he wished rather for 'cultivated and thoughtful readers' than for the fickle implied consumer of the New Journalism.<sup>13</sup> This fact, combined with the time he spends on the mathematical nuances of the idea, the tone in which he expresses it, and his own reputation as a scientist, all strongly indicate that he was far from frivolous in putting his idea forward.

The fact that Galton was making a serious suggestion, however, has not prevented the final document from incorporating into its very heart elements of imaginative writing which align it distinctly with early works of science fiction, and with the tone of the illustrated magazines with which the *Fortnightly* initially seems to contrast. Galton sets up the imaginative conceit of the piece on its second page in a revealing and rather wonderful sentence:

The simplest way of explaining my method is to suppose that Mars began to signal, to the wonderment of our astronomers, who sent descriptive letters to the newspapers from day to day, out of which the following imaginary extracts are taken:<sup>14</sup>

The eleven fake newspaper extracts which these words introduce constitute almost the entirety of the piece: written from the perspectives of several unnamed personae, at least one of them a scientist, they are distinguished from the brief introduction and conclusion (and the text of the other articles in that issue of the *Fortnightly*) only by the fact that they appear in slightly smaller print. Apart from a few headlines in small caps, there is no attempt to re-create the visual style of a newspaper (Fig. 1.3), but the excerpts, notionally gleaned from successive days' reporting on an actual Martian communication attempt, take the reader through the decipherment of Galton's code as if they were witness to the gradual unfolding of a current event rather than to the solution of a scientific problem.

It is immediately and inescapably obvious that this method of exposition is very far indeed from the 'simplest way' of explaining anything. There are certainly advantages to the format, since it provides a way of gently introducing the non-specialist audience to a fairly complex idea, but it seems a cumbersome imposition on the mathematical side of the discussion which is purportedly Galton's primary focus. It forces numerous descriptive tangents, of which more presently, as well as breaks and lacunae which feel increasingly superfluous as the piece moves on. But though it appears to be an artificial medium for scientific discourse, the 'newspaper extracts' format – specifically, the sequencing of the solution around a developing event – are an excellent source of *narrative*, which the "pure" idea of communicating with Mars using algebra notably lacks. The newspaper, despite its notionally objective tone, implicitly generates sensation as well as narrative: Matthew Rubery has argued that it is *because* of their neutral tone that nineteenth-century novelists were able to use newspapers as such ample sources of drama and suspense.<sup>15</sup> This is a dimension of the media which the New Journalism brought to prominence, and Galton's adoption of the sensationalist tone of the newspaper within the generally sombre pages of the *Fortnightly* is revealing. It is difficult to imagine a reason other than suspense, for instance, for the entry among Galton's series of fake extracts which simply reads 'COMPLETE DECIPHERMENT OF THE FIRST PART OF THE MESSAGE FROM MARS. Full particulars tomorrow'.<sup>16</sup> Redundant as either exposition or explanation, this short passage can only have been included as a dramatic device, Galton's 'use of the methods of the press [...] to strike



1.3 A page from Galton's 'Intelligible Signals' piece in the *Fortnightly Review* (November 1896). Courtesy of the Cadbury Research Library, University of Birmingham.

the reader right between the eyes'.<sup>17</sup> Galton's deployment of this technique places him – if only in one small respect – in the footsteps of the most established fiction writers and sensation journalists of the Victorian age.

The use of the feigned newspaper extracts brings an even greater depth to Galton's imaginative work, however. Since they were never published individually, the suspense generated by this headline comes not directly from the temporal gaps between them, but rather through an implied empathic connection with the imagined reader in Galton's world who must wait until the next day for 'full particulars'. The real-world readers of the article need only flit their eyes to the next line in order to find out what happens next, but to experience the story as a developing event (which is what the narrative demands) they must at some level imagine the sequence of extracts as being separated chronologically as well as physically. The extracts therefore evoke a periodical temporality, imposing upon an article concentrated in one time and place the imaginative and narrative dimensions of an unfolding news event. The reader comes to the extracts as an historical artefact, the suspense being generated retrospectively. This two line diversion, then – 'full particulars tomorrow' – doesn't just give reign to narrative, it also breathes life into an entire fantasy universe. This universe, the one in which the Martians are signalling, is materially demarcated from ours on the page by the smaller font size in which the extracts appear. It functions, complete with novum, in exactly the same way as an SF universe created without the agenda of real-world scientific explanation might.<sup>18</sup>

Not only is the newspaper format sensational in and of itself, the practice of quoting from it for the purposes of narrative exposition also aligns 'Intelligible Signals' with part of the tradition of popular fiction. The device echoes, for instance, Edgar Allan Poe's decision to use a newspaper to lay out the facts in his famous tale 'The Murders in the Rue Morgue' (*Graham's Magazine*, April 1841). In this story, a review of nearly all the evidence put before the detective M. Dupin is first encountered by the reader in pages of quotation from 'an evening edition of the *Gazette des Tribunaux*'.<sup>19</sup> The narrator's voice returns only to link quotations from the newspaper together ('The next day's paper had these additional particulars', p. 100), performing a similarly retrospective suspense function to Galton's 'full particulars tomorrow'. Newspapers in the nineteenth century, says Rubery, were 'just one of the ways in which novelists played upon audience expectations by introducing competing layers of verisimilitude into the fictional narrative'.<sup>20</sup>