

The Evidence Against “Leonardo’s Bicycle”

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NEWS OF A BICYCLE-LIKE sketch said to have been discovered during the ten-year restoring period of Leonardo da Vinci’s *Codex Atlanticus* popped up in 1974, when literary historian Augusto Marinoni gave a lecture in Vinci, Leonardo’s birthplace. From the chronology of disclosures and (in part circumstantial) evidence, it is now becoming clear that we are dealing with a recent forgery.

Several nations have been involved in the bicycle’s (and the motorcycle’s) development, and some decisive concepts can be attributed to individuals within those countries. Thus, for example, the basic two-wheeler concept on which all bicycles are based is attributed to Karl von Drais, a civil servant with a background in technology acquired at the University of Heidelberg in Germany.¹ Drais’ invention is well-documented with patent specifications and other materials which suggest that it was unprecedented.

Nevertheless, the competition between the industrial nations leading to World War I created jingoistic priority myths, usually launched to attribute priority to the forger’s nation. Even before this conference was initiated in 1990 by Nicholas Clayton to replace such myths by serious historiography, our French delegate Jacques Seray had been able in 1976 to destroy the non-steerable two-wheeler myth created in France in the 1890s and generally accepted thereafter.² But until 1976 it was believed worldwide that the first incarnation of the two-wheeler principle was not steerable (a myth that is still repeated by some today), and therefore priority myths depict unsteerable two-wheelers, too.³ Seen in the light of Seray’s research, “Leonardo’s bicycle” publicized worldwide in 1974⁴—and again non-steerable—left bicycle historians like Derek Roberts skeptical, since a “law of series” appeared to apply.⁵

Evidence:

- The “Leonardo bicycle” sketch shows a non-steerable two-wheeler in an attempt to outdo the false French priority which was still believed to be correct before 1976.

This is also confirmed by a comparison of the pictorial bicycle evolution taken from the standard Italian book on history of technology⁶ and from Marinoni, Ref. 19 (see Fig. 5.2).

The Sisyphean task of tracing the debate on the restoration of Leonardo’s *Codex Atlanticus* in Italy thirty years ago is eased by the fact that Augusto Marinoni, an Italian lexicographer and philologist, then at the Catholic University of Milan, appears to be the only maintainer of the genuineness of the bicycle sketch among Leonardo scholars. Catalogues of exhibitions and books where Marinoni was not involved demonstrate a conspicuous absence of the bicycle sketch (e.g., Ref. 12). In what follows, I will concentrate on the bicycle sketch alone.

The restoration of the *Codex Atlanticus* was the result of an initiative of engineer Nando di Toni,⁷ who ran a Centro Ricerche Leonardiane in Brescia with a newsletter *Notiziario Vinciano*, and French Leonardo scholar André Corbeau, who managed to exhibit original sheets from the *Codex* in Paris as early as 1961. This may account for the different durations given for the restoration period: While Marinoni talks of ten years, between 1960 and 1970 (presumably to include dismantling of the album for the Paris exhibition), the director of the Biblioteca

Ambrosiana in Milan specified the restoration period as 1966 until 1969.⁸ Pope Paul VI, born a Brescian and at that time archbishop of Milan, gave his consent to the restoration under the condition that it was to be performed by monks in the cloister Grottaferrata near Rome for the reason that the *Codex Atlanticus* and the Ambrosian Library belong to the Vatican.

An American in Madrid

Nine monks had already been working on the restoration of the *Codex Atlanticus* for one year at Grottaferrata when sensational news electrified the press worldwide in 1967: Jules Piccus, a Bostonian Romanist, had accidentally discovered two albums of Leonardo notes and drawings in the National Library of Madrid when ordering something else. These were called *Codices Madrid* henceforth. The news⁹ was accompanied by a sample page (Fig. 5.3), definitely showing chainwheels with chains for lifting buckets with counterweights for wells or the like, the idea being apparently to replace a rope and pulley in order to prevent the rope from jumping off the pulley or to avoid early attrition. Leonardo's handwriting there says, "How to make the rope of a counterweight, which never winds upon itself, pull with strength..." Reti was enthusiastic:¹⁰

... Leonardo's beautiful sketches of a hinged-link chain for a wheel-lock of a gun¹¹ were well known, but that chain had only a few links and, of course, was not endless. Now we have a whole collection of true chain-drives and sprocket wheels. In case we should be in any further doubt, attention is called to the little drawing at the bottom, where a complete assembly is masterfully sketched.

Thirty years later this has given way to a more sober interpretation:¹²

... Leonardo designed several types of chains. He especially recommended their use in preference to ropes for lifting heavy loads. He did not, however, seem interested in exploring the use of chains to transmit motion.

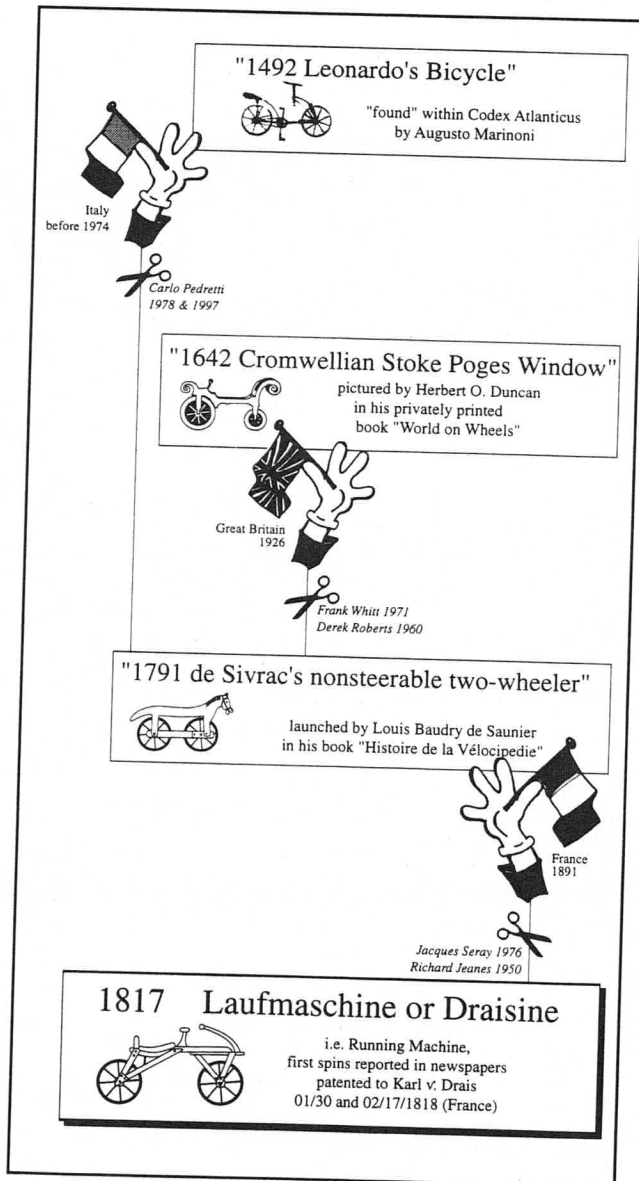
But at their press conference in Boston on February 1967, apparently Piccus or Reti had popularized the transmission chain as "bicycle-like."

Evidence:

- The worldwide communication of the popularisation "bicycle-like" for the transmission chains from *Codices Madrid* suggested the forgery of a "Leonardo chain bicycle" to the forger(s), allowing the forgery to be dated to the post-1967 period. An identical chain drive appears in the bicycle sketch put into the *Codex Atlanticus*.

Fig. 5.1

Priority forgeries antedating Drais' two-wheeler concept—and how and when they were exposed.



It seems that the library's director in Madrid became disenchanted with this press interpretation and cancelled his contract with Piccus and Reti, contacting scholars in Milan and London for the facsimile edition of the *Codices Madrid*.¹³

A Bicycle Like New

Let us turn to the debate after Marinoni had released the bicycle sketch in a lecture¹⁴ at Leonardo's birthplace Vinci on April 15, 1974 covering the *Codices Madrid*—although the bicycle sketch was found in the *Codex Atlanticus*. At the time of this lecture, the printing of the bicycle sketch was irrevocably underway in the Italian original of *The Unknown Leonardo* (Ref. 4) and in volume Two of the new Giunti facsimile,¹⁵ which may have been one reason for the delayed disclosure. Or is there another reason to withhold disclosure of a seemingly sensational discovery for four years or more?

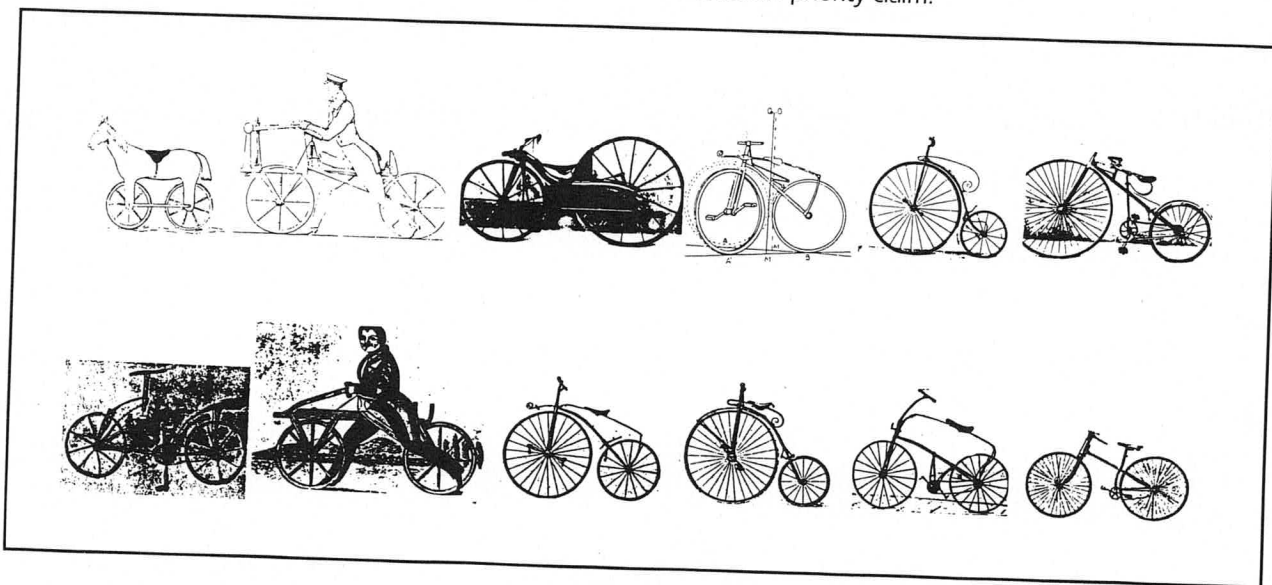
Marinoni never gave the details, nor the date of his discovery. In his presentation, he tried to disprove the objection from an undisclosed source that a youngster may have manipulated the sketch into the Codex around the turn of the century—presumably a rhetorical position he thought up himself. It is, of course, not good academic style to conceal names or quotes of opponents—and Marinoni holds back the fact that the *Codex Atlanticus* had undergone a ten-year reproduction for the old Hoepli facsimile¹⁶ at the turn of the century, providing access to it for many. Also it is the experience of this conference that jingoism befalls those with greying temples rather than young people.

The bicycle sketch became known worldwide through the popular three-volume set *The Unknown Leonardo* in 1974. Not many then realised that the bicycle find was not in volume 3, *Leonardo The Inventor*, where it would have belonged, but banished into an appendix to the second volume, *Leonardo The Scientist*, among whose authors was Augusto Marinoni—an indication of a dissension between sceptic editor Reti and maintainer Marinoni. Clearly the sketch is not from Leonardo's hand, and without proven contemporaneity of the scribbles, Marinoni's tale of a pupil copying the bicycle from a lost drawing of his master remains mere speculation.

After Marinoni had placed the news¹⁷ in the Italian weekly magazine *L'Espresso* under the title "A Bicycle like new," several authors came to the rescue of Italian scholarship. Nando de Toni, former member of the Commissione Vinciana, wrote the following letter to the editor:¹⁸

As to the bicycle, I want to indicate that on various occasions some sheets from the *Codex Atlanticus* have left more or less officially the Ambrosiana before the restoration requested by friend André Corbeau and the writer. Whoever had the opportunity to take away, bring to Florence, or send back from Lugano by mail, sheets of Leonardo, robbed from the Ambrosiana, was very well able at different times to poke fun at the descendants by drawing that rudimentary bicycle. To pretend to be a result of the

Fig. 5.2 Evolution of the bicycle according to Uccello, 1444, top (ref. 6) and Marinoni, 1981, bottom, showing how Marinoni replaced the fake French priority claim by a fake Italian priority claim.



times of Leonardo it certainly did not need to have the fenders, the chain cover, the brakes, the headlight, the bell and the rear reflector. It was sufficient to leave the idea of pedals, of multiplication, of chain transmission, of the seat, and of the handlebars, even when it is obviously not working in the end.

One has to add that Marinoni always works with the model of a naive forger who longed to put in a modern steel bike, only prevented from doing that by his own ineptitude. Marinoni's reaction can be read in his brochure on Leonardo's automobile and bicycle¹⁹— he disproves statements that de Toni never made:

Sticking to the idea of a forgery, the engineer Nando de Toni proposed in a letter to *L'Espresso*, that had published a short note by the author in April 1974, the following solution to the "who-dunit." As is known, during a series of thefts in the Ambrosiana in the year 1966, also a sheet of the *Codex Atlanticus* was lost. According to de Toni, this should have concerned sheet No. 133. To raise the value of his prey, the thief should have sketched a bicycle on it, believing that one would regard any scribble, however senseless, as the work of the universal genius and farsighted Leonardo da Vinci. What a foolish thief had indeed expected to be able to imitate Leonardo this simply? In reality, the drawings concerned were on sheets 342–43 according to the old count, and have been published in the weekly magazine *Epoca* of November 24, 1963. Other sheets never left the Ambrosiana, and sheet 133 was at the time of the theft already in Grottaferrata for restoration, since the Codex was brought there in parts.

The strategy is to give the reader the impression that the opponent has been disproved completely without letting him know the opponent's argument.

Another member of the Commissione Vinciana, Anna Maria Brizio, art historian at the university of Milan and coauthor of *The Unknown Leonardo*, was interviewed²⁰ by the monthly magazine *Panorama*:

The point is to ascertain if the sketch of the bicycle was already on the back side of sheet 133, when Pompeo Leoni assembled the manuscript at the end of 1500s, or if somebody put it in during a following epoch. How can one be sure that in 300 years of migration the sheet had not fallen in the hands of an extemporaneous draftsman? To solve the question, it remains only to consult the experts: only a chemical test could tell if Leonardo's bicycle is another marvelous anticipation or a vulgar scrawl.

Marinoni replies like this:

...Professor Anna Maria Brizio, who uttered skepticism for the case, based her opinion on the following arguments: Firstly, we are not certain that the sheet has not fallen into the hands of a hobby drawer during its 300-year migration. Secondly, the bicycle was drawn with a different ink than Leonardo used for the fortification on the front side of sheet 133. The first argument was already partly invalidated by the journalist who didn't consider the error of the 300-year migration in detail (it presumably never happened in reality) but who remarked correctly that the first modern bicycle goes back to the year 1885 and that therefore the "forgery"—if one has to do with that—could not have originated before the end of the last century. But the journalist did not know that the sheet was in the codex in 1965 and that the forger could have been only one of the restorers or the first scholars concerned with the project (possibly even the undersigned). The second argument, however, is an improvised wrong as supposition, since we have not an ink drawing—as already said—but a pencil drawing.

Apparently a chemical analysis or an age test was never performed on the bicycle sketch. And like in the famous case of the Piltdown Man, we always have the option that Marinoni was the uninitiated discoverer of what was done by a different forger or forgers. However, an important piece of evidence in dating the bicycle sketch is that it is not from Leonardo's hand and produced no visible set-off overleaf in contrast to the obscene scribbles surrounding it—an indication that it has been put in after the unfolding of the sheet.

An International Opponent

A serious blow to "Leonardo's bicycle" appeared in Carlo Pedretti's catalog of the restored sheets of the *Codex Atlanticus*.²¹ The art historian at the University of California, Los Angeles (UCLA) describes the restoration as chaotic—he always talks of the monks as "restorers" in quote— and gives examples of how they made things worse. He deplores the lack of any scientific report by the "restorers"—reportedly some sketches have disappeared through the use of unknown chemicals. About the obscene back side of sheet 132 he writes:

Scribbles, not by Leonardo, probably not from Leonardo's time. Self explanatory.

And on the back side of sheet 133:

Scribbles, including the word "salaj," not by Leonardo, probably not from Leonardo's time. Self-explanatory. See f. 132 verso, to which this sheet was originally joined. When I examined the original sheets in 1961, holding them against a strong light so as to detect elements of their (at the time) hidden versos, I noticed the presence of scribbles in black chalk as well as light traces of circles in pen and ink, which appeared to be the beginning of some geometrical diagrams. These have turned out to be part of a rough sketch of a vehicle that resembles a bicycle. Similar rough sketches, not by Leonardo, are found on other sheets of Leonardo's manuscripts and drawings.

And he encloses a sketch from memory²² of what he saw in translucence back in 1961 (Fig. 5.3 top); in a postscript he attributes no significance to the bicycle scribble:

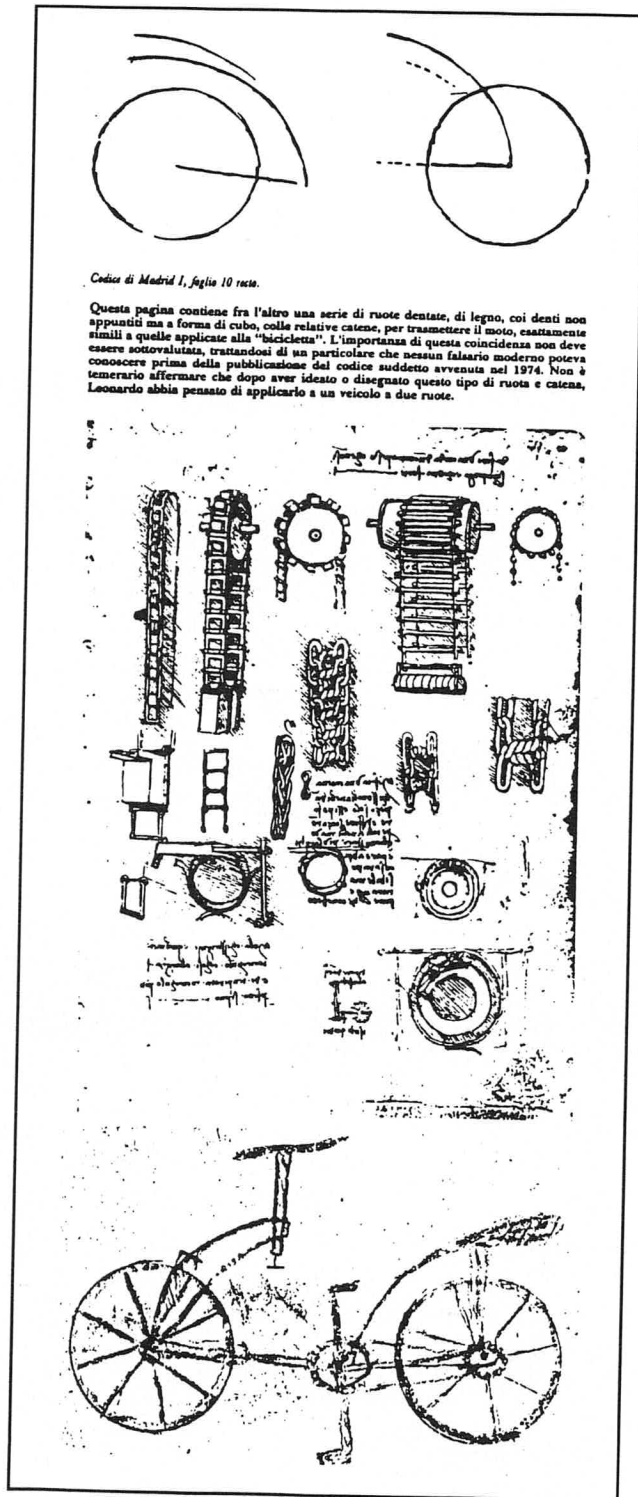
The scurrilous scribble of a pupil on the verso of a two-part sheet of fortification studies, ff. 132 and 133, hardly deserve the attention they have received in recent publications, and even less so does the sketch of a bicycle.

He quotes Marinoni by Ref. 4 and Ref. 14. Marinoni replies to Pedretti in his brochure, again disproving statements that were not made:

Apparently Pedretti is convinced that we have to accept his unfounded judgement simply *quia ipse dixit*. Still he acknowledges that the drawings are authored by a young man, a pupil, but whose pupil? Certainly not Leonardo's, if we assume following Pedretti that Leonardo had been dead a fairly long time. How could a young man—some tens of years later—have remembered another young man having lived much earlier and infuriated without reason against the shadow of a past mean while long gone? Which celestial intuition would have caused him to draw exactly this bicycle with the meticulous detail of chain and chainwheel that was already drawn by Leonardo at a time unknown to him? There is no logical answer to these questions, but the fact that a young man drew a bicycle in the middle of the 16th century appears to be quite unimportant to Pedretti. He pleads to pass this problem over, as if it would suffice to close one's eyes to let the bicycle disappear. I don't believe that other scholars are ready to follow this willful proposal.

Fig. 5.3

Translucent verso of sheet 133 of Codex Atlanticus in 1961 (top, from Ref. 21, the sample page from Codices Madrid of 1967 plus Marinoni's legend with untrue statement (center, from Ref. 19), and the bicycle sketch published in 1974 (bottom, from Ref. 4).



Whereas Marinoni's recent Internet Web page of the city of Legnano²³ contends, "This is a decisive argument on which I could not rely in 1972."

Evidence

- In 1961 the translucent back side showed geometrical circles and lines. The bicycle sketch definitely was not there, since its thick brown crayon would have been detected easily in translucence.²⁴

The forger(s) made economic use of the lines already present (to minimize crude erasures like the ones between the wheels) which explains the idiosyncrasies of the handlebar design. Accordingly,

the bicycle sketch is definitely a recent forgery that can be dated between 1967 and 1974.

To protect the inference that the appearance of the chainwheel from *Codices Madrid* within the sketch of the *Codex Atlanticus* warrants the mental authorship by Leonardo himself, Marinoni leaves the path of truth in his brochure, stating the legend to the page from *Codices Madrid* (see Fig. 5.3 center) and again on his Web page (Ref. 23):

The importance of this coincidence should not be underestimated, since this is a detail that no modern forger could know before publication of the said Codex in the year 1974.

This refers to the facsimile edition of *Codices Madrid*, Ref. 13. But—see above—there were

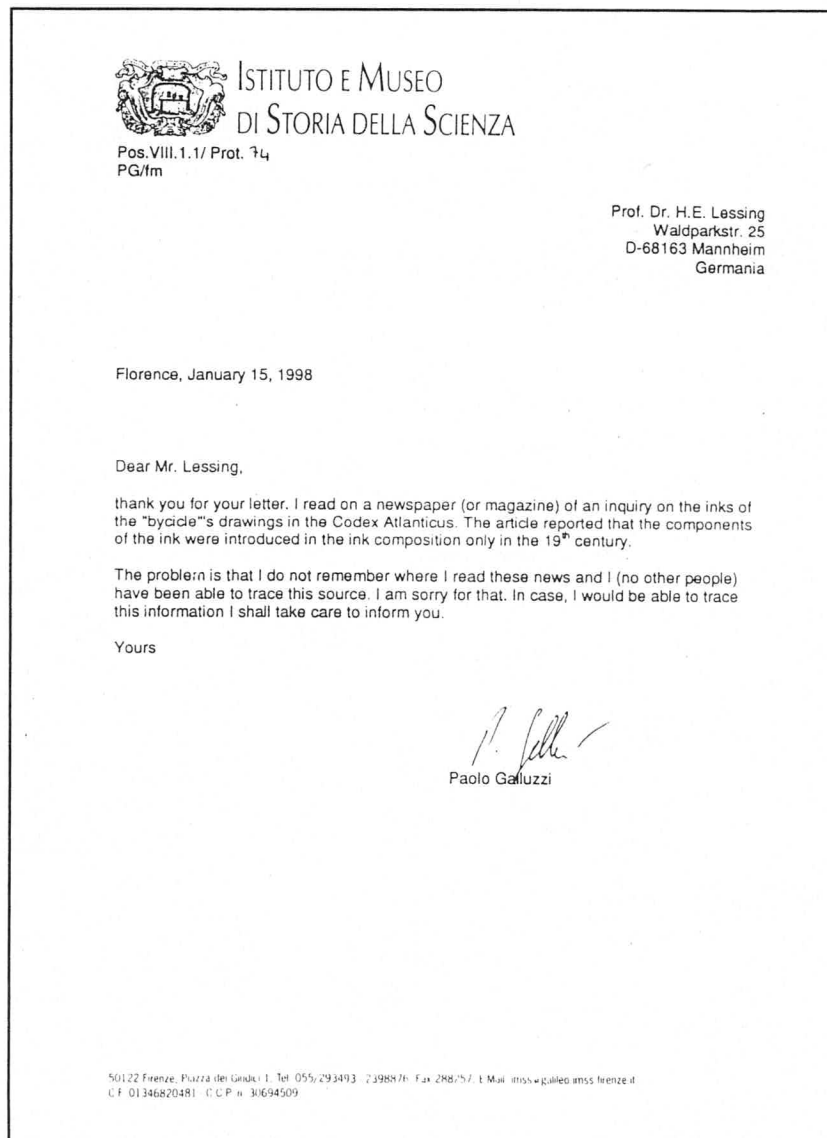


Fig. 5.4
Letter of 15 January 1997 from
Paolo Galluzzi to the author of the
present paper.

numerous newspapers and news magazines worldwide reporting this very sample page in 1967, including an Italian publication by Nando di Toni in 1967.²⁵ It can be predicted that Marinoni or his Internet-publishing entourage will use his piecemeal release of discovery detail to claim now that he discovered the sketch before 1967; but having lied once, he will no longer be believed by academia.

Jingoism Forever

In 1983, three American authors realised that a nonsteerable two-wheeler was no longer credible and assembled a steerable one from Leonardo's machine elements. Their paper was apparently rejected by American referees of history of technology (assembling a dishwasher from Leonardo's elements does not prove he thought of one), but not by the German journal *Technikgeschichte*. Their article disclosed the following:

Dr. Silvio A. Bedini of the Smithsonian Institution informed us amiably that Dr. Reti has still been convinced until his death that the drawing is not genuine and therefore he would not include it in his volume [*The Unknown Leonardo*, Ref. 4]. Professor Marinoni took over the editorship after Reti and decided to include the sketch.

Thus we now have another reason for the delayed disclosure—Reti's opposition until his death in 1974. When Marinoni was invited to give a presentation at the 2nd Cycling History Conference in St. Etienne in 1991,²⁷ he was confronted by the author of this paper with this statement of the leading Leonardo expert with a technological background. In return, Marinoni presented as a humorous anecdote that Reti indicted him to be the forger, which was

unfortunately not recorded in the Proceedings, but can now be found on the Web page Ref. 23:

The first opponent was Ladislao Reti, whom I told the discovery during my first examination of the restored codex, while I wrote a report for the Commissione Vinciana in Rome. Reti denied resolutely any possibility that Leonardo could imagine such a vehicle in the 15th century. But when I accompanied him into the Biblioteca Ambrosiana and he was before the picture he had to admit: "This is really a bicycle—therefore it is a forgery." "Who has done it? And when?" I asked him. The answer was more extraordinary still than the discovery: "This was done by you!" [L'hai fatto tu!]

Again, Marinoni fails to date this incident.

So what was the motive of the forger(s) or the uninitiated discoverer and maintainer with a bad scholarly conscience? Perhaps the following passage, written in 1949 by the Italian literate Curzio Malaparte gives us the answer:

In Italy, the bicycle belongs to the national art heritage in the same way as Mona Lisa by Leonardo, the dome of St. Peter or the *Divine Comedy*. It is surprising that it has not been invented by Botticelli, Michelangelo, or Raffael. Should it happen to you, that you voice in Italy that the bicycle was not invented by an Italian you will see: All miens turn sullen, a veil of grief lies down onto the faces. Oh, when you say in Italy, when you say loudly and distinctly in a café or on the street that the bicycle—like the horse, the dog, the eagle, the flowers, the trees, the clouds—has not been invented by an Italian (for it were the Italians that invented the horse, the dog, the eagle, the flowers, the trees, the clouds) then a long shudder will run down the peninsula's spine, from the Alps to the Etna. (Pryor Dodge, *The Bicycle*, Flammarion, Paris/New York 1996.)

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- 3 Herbert Osbaldeston Duncan. *The World on Wheels*, Paris, 1926, p.265. In reality, the Stoke Poges window shows a one-wheeled waywiser for land surveyors; see Frank R. Whitt in *Cycletouring* (London), 10.6.1980 and Derek Roberts in *The Boneshaker*, No. 20 (1860).
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 - 9 e.g. *Newsweek* (New York), 27.2.1967, p. 43, sporting the caption "Leonardo's bicycle-like drives," to the wrong figure; *Der Spiegel* (Hamburg), No. 11/1967 p. 137, "mit der Vorrichtung zur Kraftübertragung nach Art der Fahrradkette;" *Epoca* (Milan), 12.3.1967, p. 83, "schizzi di trasmissioni a cateno sul tipo di quelle adottate per le biciclette."
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