

Alfred Binet and Crépieux-Jamin: Can intelligence be measured scientifically by graphology?

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ABSTRACT

It is rarely mentioned that Alfred Binet (1857–1911), who had worked as a lawyer in Paris between 1878 and 1884, had always been interested in forensic examinations, particularly when they involved handwriting analysis. In France, the “Dreyfus affair” in 1894-1895 drew public attention to the potential usefulness of handwriting analysis in legal matters. However, Binet, who became recognized as an experimental psychologist at that time, initially considered graphology to be a pseudo-science. In his opinion, the scientific reliability of handwriting analysis still needed to be proved, a major obstacle that prevented this method from being employed in a legal framework. However, as he became progressively more interested in the applications of scientific psychology, Binet's attitude was modified in the early 1900s when he decided to test the scientific validity of graphology with the help of experts in the field, among whom was Jules Crépieux-Jamin (1859-1940). This shift can be explained by his growing interest in individual psychology as well as by his enrolment in the *Free Society for the Psychological Study of the Child*. This society had created a committee dedicated to handwriting analysis. Interested particularly in the scientific study of intelligence, he collaborated, from 1902 onwards with Crépieux-Jamin in several experiments aimed at discovering objective and

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exterior signs of intelligence in handwriting. He published an interesting book in 1906 about what can be deduced from handwriting in scientifically controlled studies. In the current paper we propose 1. an analysis of the context of Binet's interest in graphology, 2. a review of his multiple works in this field, and finally, 3. an account of the reception of Binet's book on graphology. The studies conducted by Binet in the field of graphology were typical examples of the scientific approach he promoted in psychology; namely, the detailed investigation of the behavior of a few exceptional individuals.

Alfred Binet et Crépieux-Jamin : l'intelligence peut-elle être mesurée scientifiquement à l'aide de la graphologie ?

RÉSUMÉ

On n'a pas assez souligné qu'Alfred Binet (1857-1911), qui a été avocat au barreau de Paris entre 1878 et 1884, a toujours été très intéressé par les questions d'expertise judiciaire en général et par l'analyse graphologique de l'écriture manuelle en particulier. En France, l'intérêt du public pour la graphologie va être mis en lumière dans le domaine judiciaire lors de l'affaire Dreyfus (1894-1895). Binet, devenu un psychologue expérimentaliste de renom, va cependant considérer dans un premier temps que la graphologie n'est qu'une pseudo-science qui ne peut apporter aucun concours à la justice parce qu'elle n'a pas montré sa fiabilité au plan scientifique. Cette condamnation ne sera cependant pas définitive, car au début des années 1900 Binet va être de plus en plus attiré par les applications de la psychologie scientifique. Il décide ainsi de tester le caractère scientifique de la graphologie en s'adressant à des professionnels avec qui il va collaborer étroitement, le plus célèbre d'entre eux étant Jules Crépieux-Jamin (1859-1940). Ce changement d'opinion de Binet est dû à l'intérêt qu'il va porter à la question de la psychologie individuelle et à son implication dans la Société Libre pour l'Étude Psychologique de l'Enfant (SLEPE) qui va mettre en place une commission de graphologie. Intéressé par l'étude scientifique de l'intelligence, il va collaborer à partir de 1902 au plan expérimental avec Crépieux-Jamin dans le but d'étudier les signes extérieurs et objectifs de l'intelligence dans la graphologie. Il publia en 1906 un ouvrage intéressant à ce propos. Dans cet article nous proposons 1. une analyse contextuelle de l'intérêt de Binet pour la graphologie, 2. une revue de ses multiples travaux sur ce thème, 3. une analyse de la réception de l'ouvrage de Binet sur la graphologie. Ses travaux sur la graphologie constituent un exemple typique de l'approche scientifique que Binet défend en psychologie : étudier en détail le comportement de quelques sujets d'exception.)

The studies conducted by Alfred Binet (1857-1911) in the field of graphology are little known. In her biography of Binet, the American psychologist Theta Wolf (1904-1997) only briefly mentioned them in Chapter 4, which was devoted to the emergence of the first useful test of children's intelligence. They are found in a section concerning the search

for physical signs of intelligence (Wolf, 1973, pp. 156-158). In the present paper it will be shown, however, that graphology, which is a method for handwriting analysis, attracted Binet's interest for two reasons. First, he was convinced that the scientific reliability of graphology had to be proven before it could serve as evidence in legal matters. Second, he hypothesized that graphology could be a potential tool for the scientific evaluation of children's intelligence.

Binet's interest in legal matters had its roots in his initial education as a law student. Indeed, after completing his Baccalaureate in Paris, he enrolled in the Sorbonne University and obtained a law degree, at the age of 21, on November 27, 1878. However, he did not enjoy working as a lawyer and stopped practising in December, 1884 in order to focus fully on scientific psychology (Klein, 2011). Impressed by the books of Théodule Ribot (1839-1916) and Hippolyte Taine (1828-1893) (e.g. Ribot, 1870, 1879, 1881; Taine, 1870), Binet worked on hysteria and hypnosis with Jean Martin Charcot (1825-1893) at the Salpêtrière hospital (see Binet, 1890, 1892; Binet & Féré, 1887). In 1891, he joined the laboratory of physiological psychology headed by Henry Beaunis (1830-1921) at the Sorbonne, where he devised an original research program in psychology (for an extensive review see Nicolas & Sanitioso, 2012). In January 1895, he was appointed director of the laboratory. At that time Binet (1896) was interested in clarifying the characteristics of individuals, particularly their intellectual types; he wanted to develop an "individual psychology" (see Binet, 1898b; Binet & Henri, 1896; Binet & Vaschide, 1898) that would establish knowledge of an individual's intellectual and moral nature. Although the applications of individual psychology are numerous, Binet found them to be particularly interesting in the areas of pedagogy and justice. It was in this context that he came to know the work of Jules Crépieux-Jamin (1859-1940), who claimed that personality could be investigated through graphology.

Between the years 1894 and 1898, handwriting analysis had been at the heart of a court case that would leave a deep mark on the history of France at the turn of the 20th century: The "Dreyfus affair". The French officer Alfred Dreyfus (1859-1935) had been charged with high treason for handing classified documents to German forces. On January 5th, 1895, he was stripped of his army rank and sentenced to life imprisonment on Devil's Island in French Guiana. It is important to note that the prosecution was based only on a single letter, unsigned and undated, named the "bordereau" (Crépieux-Jamin, 1907), that had been addressed to the German embassy. This letter indicated that classified military information was about to be passed on to a foreign power. A handwriting analysis, carried out by amateur graphologists, concluded wrongly that the "bordereau" had been

written by Dreyfus. Binet, who had been a practicing Paris lawyer, believed that Dreyfus was innocent; he also doubted that graphology could be considered as a science. For this reason, he considered that the conclusions of the inquest ought not to have been based on graphologists' conclusions. A few years later, inspired by his interests in legal matters (Binet, 1900) and in the scientific study of intelligence in children (*cf.* Binet, 1903a), Binet decided to test the scientific reliability of handwriting analysis and from 1902, collaborated with Crépieux-Jamin in an effort to ascertain whether handwriting yielded objective and exterior signs of intelligence.

In the present paper we aim to narrate the evolution of Binet's ideas about graphology in the context of his growing interest in that topic. The reconstruction of this unknown story will be based on historical records, situating it in the context of its period.

1. GRAPHOLOGY AND EXPERTISE: A PSEUDO-SCIENCE INITIALLY CONDEMNED BY BINET (1895-1898)

1.1. Some words on the origin of graphology and Binet's first public opinion on graphology (1895)

Although graphology is said to date back several centuries, its modern strain was developed in France in the latter half of the 19th century (Seiler, 1995, 2000). It was the French abbot Jean Hippolyte Michon (1806-1881) who coined the term "graphologie" (graphology) in the 1870s. On November 18, 1871 the first issue of his graphological journal was titled "La graphologie" (Landau, 2007). In April 1872, he published with Adophe Desbarrolles (1801-1886), a well-known book on the mysteries of handwriting (Desbarrolles & [Michon], 1872). Michon claimed to have discovered a certain number of signs in a sample of handwriting, each of which was capable of direct interpretation (see Michon, 1875; Michon, 1878).

But it was a disciple of Michon, Jules Crépieux-Jamin (1859-1940), who would become the most famous graphologist of this era. Jules Crépieux was born in Arras on December 28th, 1858. He was the youngest child of a bourgeois family of four children. After his studies, he became a watchmaker. Then, in 1881, he moved to Geneva (Switzerland) with his mother, where he began to study odontology. Appointed assistant to the dental school of Geneva in 1888, he obtained his doctoral degree on May 20th, 1889. In Geneva, he met Juliette Jamin, whom he married. The couple returned to France to live in Rouen, where he practiced his new profession.

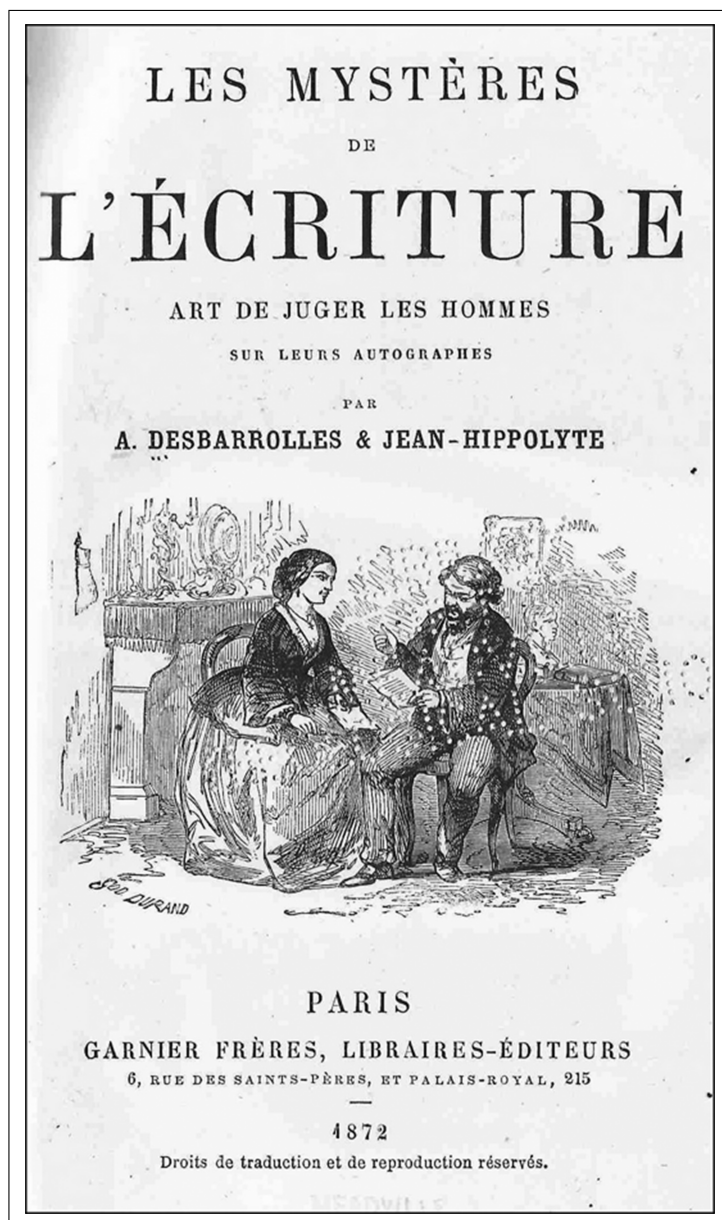


Figure 1. One of the first books on graphology, entitled “On the mysteries of handwriting” written by Adolphe Desbarrolles (1801-1886) and Jean Hippolyte [Michon] (1806-1881) in 1872. [Private collection Serge Nicolas]

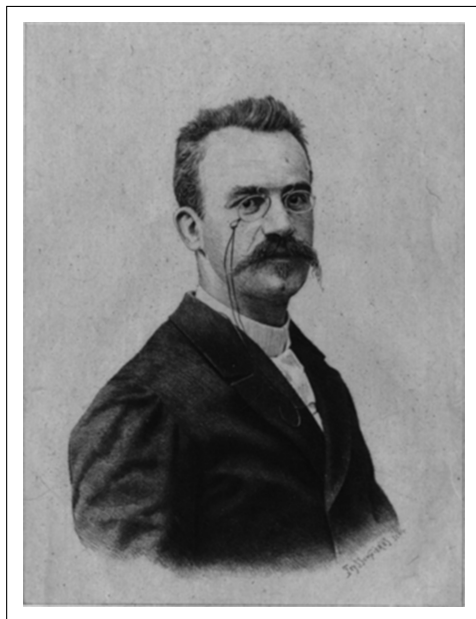


Figure 2. Portrait of Jules Crépieux-Jamin (circa 1900).
[Archives départementales du Pas-de-Calais, 79 J 1]

Jules Crépieux-Jamin, the name he had used following his marriage, had numerous interests including watches, music, magnetism, and especially graphology, which he had discovered after having read Michon's books. But he disagreed with the principle advocated by Michon, of attributing rigid interpretations to single signs. In 1885, he proposed a new grouping, denoted as a system of "handwriting signs", as well as a classification based on new rules (Crépieux-Jamin, 1885, 1888). Interpretation of the signs, it was claimed, was "scientifically" based on a division of the signs into analyses of two types. First, there were general signs, such as clearness, angle of the letters, etc.; and second, there were some particular signs, such as the identity of "n" and "u", the way "t" was crossed, etc. (Crépieux-Jamin, 1885). Later, he proposed a complex classification system of six categories to each of which each graphological sign could be assigned. The six categories he originally used were named: Dimension, Form, Intensity, Direction, Layout and Continuity (Crépieux-Jamin, 1888).

Nevertheless, in his review of the third edition of Crépieux-Jamin's (1895) book, Binet concluded: "All this does not constitute science; it is

simply exposition. And if a tone of authority can be put into an affirmation, this does not increase its demonstrative force. The feeblest element of the book is its lack of proof. . .” (Binet, 1895, p. 430). So for Binet, the former lawyer in Paris who had become a scientific psychologist, if Crépieux-Jamin had been in charge of the graphological analysis of the famous “bordereau” in the Dreyfus affair, his conclusions would have been tarnished by doubt, because no experimental proof existed concerning the genuineness of his graphological analysis. According to Binet, therefore, Crépieux-Jamin at that time, was not capable of providing scientifically reliable evidence of Dreyfus’s innocence.

Binet and Henri (1896) wrote:

Everybody has, as we know, a very characteristic and personal handwriting, which, for any individual, can generally be modified only between well restricted limits. As early as the 18th century and maybe even earlier, we sought to take advantage of these differences in writing, in an effort to arrive at conclusions relating to the character of the individual; a branch of special research has even been created: “Graphology”. But we wanted to do too many things at once, and imagined the problem as being easier than it really was. This led to a contempt, by scientists, for graphology. It is, we think, the reason why graphic movements have still been so little studied by scientists. Nevertheless we cannot doubt that we can find some benefits for individual psychology. Certainly we do not want to affirm that one day we will be able to deduce, from the writing of an individual, his/her character, but there probably do exist some connections between graphic movements and certain psychological processes. It is these connections which should be studied more closely using experimental methods (Binet & Henri, 1896, p. 418).

1.2. The Dreyfus affair and the importance of graphology

For several years the French sociopolitical context was marked by the rise of nationalism and anti-semitism. France wanted to take revenge after its defeat by Prussia and Prussia’s annexation of the regions of Alsace

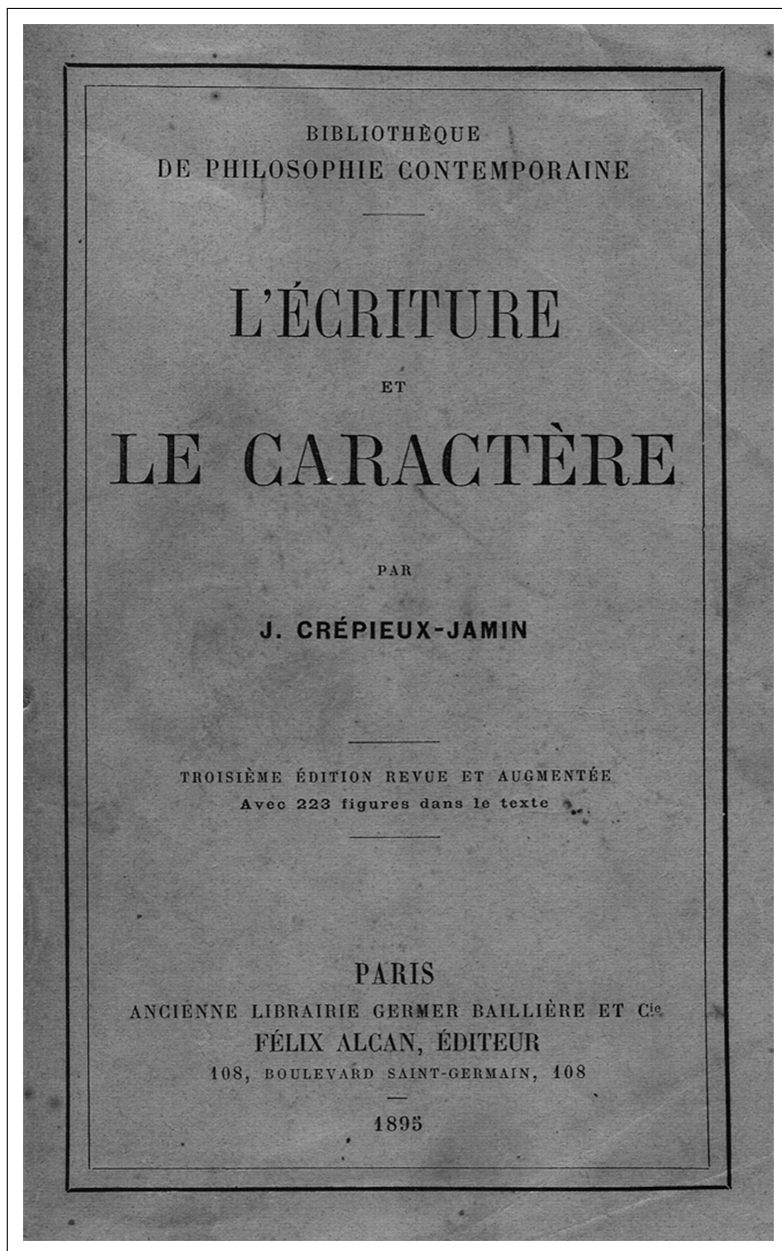


Figure 3. Third edition of Jules Crépieux-Jamin's famous book on handwriting and character (1895).
[Private collection Serge Nicolas]

and Lorraine (1871). It was in this context that the famous scandal of the Dreyfus Affair came about (Begley, 2009; Harris, 2011; Reed, 2012; Whyte, 2005), and in which the value of graphology would be highlighted (*cf.*, Crépieux-Jamin, 1907). In September, 1894, the French Army's counter-intelligence service discovered that a "bordereau" (see Crépieux-Jamin, 1907) containing information about French military secrets had been transmitted to the German Embassy. Captain Alfred Dreyfus (1859-1935), who worked on the General Staff, was immediately suspected by the commandant Armand du Paty de Clam (1853-1916), an amateur and non-expert in graphology, because of the similarity of Dreyfus's handwriting with that of the "bordereau". Suspicions seemed further justified because he was both Jewish and Alsatian. Alfred Gobert, a handwriting expert from the *Banque de France*, had concluded that anyone could have been the author of the "bordereau". However, the head of the Bureau of Identification in the Paris Police Department, Alphonse Bertillon (1853-1914), the inventor of anthropometry (but who was not an expert in graphology), also claimed that Dreyfus had written the "bordereau". Three new experts in handwriting were appointed, namely, Charavay, Teyssonnières and Pelletier, but only the last of these declared that Dreyfus was innocent. Despite the fact that the different handwriting analyses of the bordereau had been contradictory, Dreyfus was arrested on October 15, 1894 and appeared before the court martial in Paris on December 19, 1894. He was sentenced to life imprisonment three days later on December 22, 1894, and stripped of his army rank on January 5, 1895.

In 1896, however, doubts emerged about his guilt. Indeed, on January 21, 1896, it was discovered that Major Ferdinand Waslin Esterhazy (1847-1923) had had relations with the German embassy; moreover, Esterhazy's handwriting was identical to that of the "bordereau" which had led to the condemnation of Dreyfus. The facsimile of this "bordereau" was published, on November 10, 1896, in the daily paper *Le Matin* (n° 4638, 13th year, p. 1). On May 29, 1897, Crépieux-Jamin was mandated by Bernard Lazare (1865-1903) to participate as an expert witness concerning the notorious "bordereau" (see Lazare, 1897). In his report dated August 12, 1897, Crépieux-Jamin argued that the author of the text was not Dreyfus after all, and thereby contributed to proving his innocence. Identical conclusions were reached by other graphologists, among whom was the child psychologist Wilhelm Preyer (1841-1897) who was also a specialist in graphology (see Preyer, 1895; Lazare, 1897). The "Dreyfus affair" was born at that time, following the acquittal on January 11, 1898, of the real traitor, Esterhazy. It was then that Émile Zola (1840-1902) published his famous article "J'accuse !" in the daily paper *L'Aurore* on January 13, 1898. Zola



Figure 4. Jules Crépieux-Jamin at the thirteenth session of Zola's trial, by L. Sabattier. In Bonnamour, G. (1898). *Le procès Zola. Impressions d'audience* (p. 187). Paris : A. Pierret.
[Private collection Serge Nicolas]

supported the innocence of Dreyfus and accused yet three more experts on handwriting, Belhomme, Varinard and Couard, who had argued that the handwriting of the “bordereau” was not that of Esterhazy, of having “made false and fraudulent reports, unless a medical examination declares them affected by a disease of sight and judgment”. Zola's article led to his being named in a mediatized libel suit; he was convicted and forced into exile in England. This judicial and political scandal divided French society into those who condemned Dreyfus (the *anti-Dreyfusards*) and those who supported him (the *Dreyfusards*). Binet was in this latter camp (Klein, 2011).

1.3. A critique of graphology by Binet (1898)

These sensational trials put an interest in graphology firmly into the agenda. It was in this context that the editor of the *Revue Encyclopédique* asked one of the most famous graphologists of the time, Crépieux-Jamin (1898b), to expound the principles of this science, and invited several French personalities to give their opinion on graphology. These writings were noticed by Binet who, a few weeks later, published, in *L'Année Psychologique*, a review article on graphology where he persisted in his negative opinion about this pseudo-science: "it is possible that an individual's character betrays itself his or her writing. But it would have to be proved [...] Everything that has been said so far is a mixture of puerility and naivety" (Binet, 1898a, p. 603).

In that article, Binet (1898a) also commented on the opinions of some scholars about graphology, that had been published on February 12, 1898 in the *Revue Encyclopédique* (Encyclopedic review). He stressed that scientists were generally critical of the scientific value of graphology, and required more evidence: this was true of Charles Richet (1850-1935), Jules Marey (1830-1904), Charles Féré (1852-1907), Arsène d'Arsonval (1851-1940), and especially Jules Héricourt (1850-1938). Héricourt, who in 1888 had described, with Richet, the principle of serotherapy, had been the first in France to present the claims of graphology to philosophers and psychologists (Héricourt, 1885). He had argued that handwriting could be directly dependent both on permanent or on temporary states of personality. In an 1886 meeting of the *Société de Psychologie Physiologique* (Society of Physiological Psychology), originally founded by Charcot and Ribot to promote scientific psychology, he showed experimentally that a close link between personality and handwriting could exist, using hypnotized subjects to do so (Ferrari, Héricourt, & Richet, 1886; Héricourt, 1887). But Binet (1898a) argued that if character manipulation attained by hypnosis could influence handwriting, this need not in any way constitute a clear demonstration of the connexion between handwriting and personality in normal subjects. Thus it was that, a few years later, Héricourt (1898) criticized graphology for being non-scientific. Despite the negative opinion of Héricourt and the other renowned scientists listed above, Binet (1898a) noted with surprise that psychologists could adopt very positive opinions of graphology; they considered it to be an excellent method for psychological investigation.

Indeed, this was the conclusion reached among others, by Théodule Ribot (1898), founder of French scientific psychology (Nicolas, 2005; Nicolas & Murray, 1999), Henry Beaunis (1898), founder of the first

laboratory of experimental psychology in France (Nicolas & Sanitioso, 2012) and Gabriel Tarde, who was very interested in this new science (Tarde, 1897). So the validity of graphology was not questioned by several prominent scientific psychologists. Ribot (1898) said:

I consider graphology as based on the indisputable principle that it is our movements that reflect what there is intimate within us: character, feelings, thinking. Personality is expressed not only by words but also by motor acts, and those of the hand are among the most delicate. In contrast to physiognomy and gestures, handwriting has the advantage of being fixed. Saying that it varies according to the attitudes, the period and various influences, is a worthless objection. If it is the case that handwriting reflects our passing moods, it is also the case that behind these apparent changes, there remains a stable background. One of the main merits of contemporary psychology is to have clearly revealed what had hitherto been neglected, namely, the importance and meaning of movements, and graphology constitutes a chapter in the psychology of movement. Whether the graphologists of the various schools have completely succeeded in determining the character of the handwriting is a different issue, about which one may have reservations; but is not any theory, when put into practice, prone to many errors? (p. 151).

But for Binet (1898a), because it was not based on observation and experimentation, graphology could not be considered as a science given that its methods were based only on intuitions. At this time, Binet was developing his program of individual psychology with his collaborators Victor Henri (1872-1940) and Nicolae Vaschide (1874-1907). Interested in the experimental psychology underlying the higher mental functions, they aimed to establish qualitative and quantitative intellectual differences between individuals (Binet & Henri, 1896; see Nicolas, Coubart & Lubart, 2014). But by 1898-1899, Binet no longer had valuable co-workers who were as interested in pursuing his research on individual psychology as Henri and Vaschide had been (see Nicolas & Sanitioso, 2012). Progressively Binet was becoming interested in the individual psychology of the child rather than the adult; he developed experimental studies on suggestibility (Binet, 1899, 1900) and intelligence (Binet, 1901a, 1903a). It was in the

context of the foundation of a new scientific society dedicated to the psychological study of children that, from 1902 onwards, Binet collaborated with Crépieux-Jamin in several experiments whose aim was to establish that handwriting could contain objectively valid signs of intelligence.

2. GRAPHOLOGY AT THE SOCIETY FOR THE PSYCHOLOGICAL STUDY OF THE CHILD (1902-1903)

2.1. Foundation of the SLEPE (1899)

According to Boitel (1902) and Buisson (1900), the *Société Libre pour l'Étude Psychologique de l'Enfant* (SLEPE) was founded on November 9, 1899, following numerous publications that had called attention to American child studies (e. g. Fuster, 1900; White, 1990). Ferdinand Edouard Buisson (1841-1932), science of education lecturer at the Sorbonne and director of the periodical *Manuel général de l'Instruction primaire*, launched the following very first call on the 27 of May 1899: "Several Parisian primary school teachers, college teachers, tutors, *agrégation* holders and other students, all of whom had enrolled in the practical pedagogy class, demonstrated a keen desire for this new type of educational studies¹ and told me about their intention to create a small educational society aiming at research and practical observations the psychology of children" (Buisson, 1899, p. 225). The SLEPE was officially created with the stated goal of building "research investigations, either individual or collective, about the physical and psychological development of children" (cf. *Bulletin de la Société libre pour l'étude psychologique de l'enfant*, October 15, 1900, p. 1). The main goal of this psycho-educational Society was to put scientific psychologists, armed with improved observation apparatus and up-to-date experimental methods, in touch with educators, who had more access to children. Binet became a member of this Society very early, at about the same time as his book about testimony and suggestibility was published (Binet, 1900). He also initiated his experimental study of intelligence, with his two daughters as participants, at about this time (Binet, 1901a, 1903a). Recently published archival material shows that he undertook

¹These were attempts in other countries, including the United States, to organize a systematic series of experimental studies on child psychology. These attempts were relayed previously by Buisson's *Manuel Général*.

graphological research with his daughters starting from 1900; and in his notes dedicated to graphology he listed observations he hoped to pursue, within the SLEPE, concerned with the assessment of the scientific validation of graphology (Binet, 2011, pp. 132-147).

2.2. Binet's first work at the SLEPE (1900-1902)

As soon as he joined this Society, Binet was commissioned by Buisson to draw up a final list of projected studies and to write the first questionnaires as well. As he said later:

Our Society's two first years was devoted to questionnaire surveys. [...] We had the work of American psychological and educational societies right under our eyes, and we knew that these societies put an astonishing amount of effort into many surveys. Our questionnaires concerned three main questions: lying, wrath, indiscipline and various incidental questions such as rewards. I won't speak ill about our first trials. They certainly produced few results, but we should point out that they were also lacking in ambition. When I was commissioned to write the first three questionnaires, which was not always easy, I was perfectly aware that we were not going to make any significant psychological progress. It seemed to me then, and it still seems to me now, that these preliminary works would be helpful to some of us; they would teach us first how to manipulate the psychological language, then how to grasp the complexity of its questions, and finally how to put it to the test. (Binet, 1904e, p. 549-550).

But Binet mainly contributed to this field by stimulating original works that would be reported in the new *Bulletin* of the SLEPE, of which the first number appeared in October 1900. He will soon become this new Society's kingpin.

On January 15, 1901, just after he had been elected vice-president of the Society, Binet published his first paper (Binet, 1901b) under its auspices. He argued that psycho-pedagogy should become an experimental science. On February 18, 1901, he wrote to Buisson: "You would have been happy with our last session. It gave us a very narrow indication of the way forward. . . The Bureau has long been telling SLEPE to do work on

individual persons; the initiation of this person-centered approach appears to have been justified. School principals agree to control experiments along with their investigators, and members from the SLEPE ask for advice about experimental projects that they intend to follow personally. I repeat that this is excellent. Come on! After long hesitations, I think we're now on our way!" (cf. Klein, 2011, pp. 265-266). In April 1901, Binet (1901c) notes that the "Society itself is making progress" (p. 49) after a period of halting efforts at work. One of the early encouraging signs remained the interest of the Society's members in the psychophysiological study of children's handwriting. But some time will pass before the implementation of the Society's aims is properly achieved.

2.3. A session of the SLEPE dedicated to graphology (January 1903)

After the Annual meeting of October 19, 1902, Alfred Binet replaced Buisson as president of the SLEPE. From this date, Binet's involvement in the Society's monthly sessions will be more explicitly noted in the written records. Binet's correspondence with Gabriel Tarde testifies to Binet's interest in graphology at the time: "I know that you're interested in graphology, and I would be really grateful if you could help me with an experiment of mine that I am conducting with Crépieux-Jamin towards a more rigorous assessment of interpretations of handwriting. I would be glad if you could provide me with handwriting samples, along with a detailed psychological profile of the writers: age, profession and character. Concerning the samples, I would like two insignificant fragments of letters and an envelope [...] I am now concerned with handwriting-based gender diagnosis and the results are encouraging." (letter dated January 4, 1903, in Klein, 2011, p. 278). That is, Binet had contacted the French Graphology Society in 1902 and was now working with its most prominent specialist, Crépieux-Jamin.

During the SLEPE session of January 8, 1903, presided over by himself, Binet invited several members of the Graphology Society to attend, including its president Joseph Depoin (1855-1924) (Roussel, 1903). He proposed to the audience the following experiment: 1. to judge three men's psychological profiles on a scale of intelligence and sympathy; 2. to determine whether the addresses were written by men or women. Binet's goal was to discover whether ignorant persons were less skilled than the graphologists were at guessing the gender behind a handwriting. This little experiment was of great interest for the Paris Graphology

Society's members, who expounded Crépieux-Jamin's views on graphology in individual sessions and presented graphology's perspective on pedagogy. They were indeed convinced of the real advantages graphology could exert on the way teachers understand children. Edmond Solange Pellat (1875-1931), secretary-general of the Graphology Society, presented pedagogical graphology applications specially elaborated for the benefit of school teachers (cf., Salberg, 1903; Pellat, 1906). Graphologists present at the session affirmed graphology to be, not only a means to reveal one's character, but also a method for enhancing it. If children were taught certain writing styles, including signs of goodness, reflection, intelligence, self-esteem and will, this would suffice to communicate those corresponding qualities to the children themselves. But members of the SLEPE present at this session expressed doubts about the supposed help granted by graphology to the school teacher. Armand Belot, first school inspector of the Seine region, underlined the danger of recommending, as a scientist, a procedure that had not as yet been tested very well. SLEPE's members then advocated a rigorous oversight of the control experiments, to which the graphologists present at the session agreed. This is how the first study commission of the SLEPE, a graphology commission presided over by Belot, was created. This session of the SLEPE ended with the analysis of the data that had been collected during the session; the results showed that the audience had been able to discriminate gender on the basis of handwriting.

2.4. Foundation of a committee on graphology (1903-1904)

The goal of the graphology commission was to study the possibility that a child's character could be guessed at on the basis of his handwriting. The commission wanted primarily to verify the hypothesis that graphology could be used as a curative measure intended to change children's character by modifying their writing movements. To do so, it was necessary to conduct numerous control experiments in order to assess the scientific validity of graphology. In consultation with the Graphology Society's members, Binet took charge of the study of this newborn science. Following the renowned session on January 8, 1903, samples of several children's handwriting were initially gathered by some Parisian school teachers who knew their pupils' intelligence and character very well. The Graphology Society's Bureau received these documents and named a commission in order to study them. But the study was fruitless because of the vague, hasty and equivocal records collected by the teachers and the

graphologists alike (Féjart, 1904). In the meantime, Binet was pursuing his own graphological experiments concerning the gender, the age and the arousal level of the writer.

During the SLEPE session of June 11, 1903, Binet presented, first, his new research about determining a writer's gender (Fiévet, 1903). These investigations were carried out with the help of Crépieux-Jamin. Observations about how well the writer's gender could be guessed, were realized by means of envelopes given to the subject, some of which had male addresses on them, while others showed female addresses. Binet cited, on the one hand, the results gathered by expert graphologists like Crépieux-Jamin himself, and, on the other hand, the results gathered by non experts. These results showed that, on a basis of 100 observations, experts were able to guess the correct gender 75%, 78,8%, and 75% of the time, a proportion well above chance (50%). It was therefore true that the graphologists had been well trained at guessing the gender of a writer; but it was also true that graphological signs can be fallible. Do non experts fail more often than specialists? On 100 observations, the correct guess proportions were respectively 73% for the school teachers and 63% for 18-year-old girls without education. The gap between experts and non-experts was therefore not compelling. Concerning the age-guessing, data show that Crépieux-Jamin made errors as large as 5 years on the average, whereas non-experts showed discrepancies as large as 17 and 18 years older or younger than the writer's real age. Was age-guessing, therefore, more difficult than gender-guessing? New data were necessary to confirm that a difference in this respect existed between experts and non-expert graphologists.

Second, it was during this same SLEPE session of June 11, 1903, that Binet (1903b) presented new experimental results concerning the impact of mental excitement on handwriting. Several years before, he had attempted to estimate his two daughters' characters by analyzing differences in the regularity and precision of their handwriting. He had noticed then that Marguerite was more hurried and more nervous than Armande, who was also less error prone. After having submitted his daughters to a letter crossing-out-exercise, he wrote:

The shape of the lines is also quite different; Armande's are short, regular, writing each full letter accurately, and slightly tilted from the top to the right (thus in the opposite direction of handwriting); the twenty last lines she drew show an average length of 2.4 mm; this length varies between 2 and 3 mm.

Marguerite draws longer lines, less regular and more tilted from top to right, but she writes the letter less accurately; the last twenty lines of the fourth session show an average length of 3.06 mm, oscillating between 2 and 6 mm [. . .]. I apologize for going into these details, noting that similar experiments made on the accurate depiction of individual features in persons with well-defined mental states are of the highest interest for the progress of graphology (Binet, 1903a, pp. 239-240).

Binet subsequently sought to scientifically study handwriting when it is drawn during a state of excitement and tension. During this session at the SLEPE, Binet reported his preliminary results, which showed an enlargement of handwriting when the writer's work went along with intellectual excitement; the greater the intellectual excitement, the bigger the enlargement of the handwriting. These researches were presented by Binet in an article published at the same time in *L'Année Psychologique* (Binet, 1903b). He asked his subjects, among whom were his own daughters, as well as his laboratory employees (Victor Henri, Jean Larguier des Bancelles and Jean Philippe), to write a simple sentence such as: "The psychology laboratories do not get enough money" (Binet, 1903b, p. 60). The subjects were then asked to write the same sentence with instructions to replace each vowel by the following vowel in the alphabet: *A* by *E*, *E* by *I*, *I* by *O*, *O* by *U* and *U* by *A*. There is no debating the fact that writing the sentence "Thi psychulugy leburetuoris du nut git inuagh muniy" will take a fair amount of time, because it is a more tedious task. Binet believed that in this situation, the writer also finds himself in a more acute state of excitement than when he has simply to write normal sentences. Binet showed that the intellectually challenging task caused the traced characters to be larger and other features to be thicker, as if the pen were more strongly pressed against the paper. Other observations showed that handwriting enlargement was more pronounced in highly emotional and excitable individuals. So the enlargement of handwriting seems to be an indication of an intellectual effort that has put the subject in a state of excitement, albeit very low. These characteristic changes in one's handwriting reveal the fact that altered handwriting ceases to be an automatic movement; it is caused by a slight emphasis on the thought of the letter to be written. Could we use these differences in enlargement as an indirect measure of the degree of nervousness and excitement of students assigned to a new classroom? Binet thought the experiments did not involve a number of trials sufficient to give reliable results. However, it is noteworthy that they were

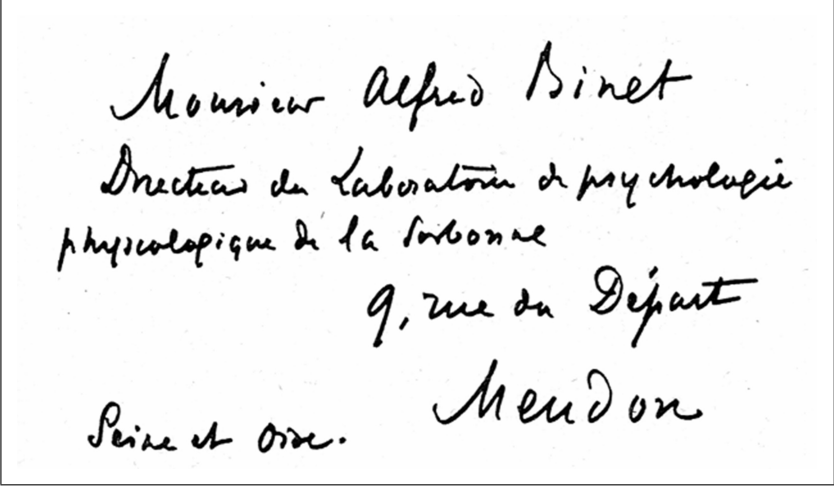
followed up, and their results were confirmed by other authors (Lemaître, 1904; Rudemare, 1905). But it was on graphology *per se* that Binet would continue his experimental work independently of his being a member of SLEPE.

3. FIRST PUBLICATIONS BY BINET ON GRAPHOLOGY (1903-1904)

3.1. Experiments on the determination of gender in handwriting (October 1903)

By the examination of a sample of handwriting, can we recognize the sex of the person who drew it? The data already obtained by Binet were encouraging. Nevertheless the possibility that gender could be determined from writing had been denied by Michon (Desbarolles & [Michon], 1872, p. 11; Michon, 1878, p. 147), even though Crépieux-Jamin (1885), in his *Traité pratique de graphologie* (pp. 253-260), had asserted that this determination was possible. To really confirm that the gender of the writer can be determined by the analysis of his/her handwriting, it is necessary to compute the chance level, because the observer can choose only between two sexes. The calculation of probabilities shows that by operating at random, without even looking at the script, we would guess correctly on one out of two guesses. Consequently, the number of correct determinations to be considered had to exceed this chance level (50%). Since it was necessary that the studied documents be devoid of significant meaning in their content, Binet took as documents letter-envelopes, each with an address, his name, a first and last name, the name of the street and the names of the city and the region. It comprised 8 to 20 words. One hundred and eighty addresses, eighty-nine written by women, ninety-one by men, were submitted to experts in graphology and lay people, who were asked to judge whether each had been written by a man or a woman.

Binet (1903c) gave, first, the results of tests to which he had subjected two French authorities on graphology (Jules Crépieux-Jamin & Jules Eloy), and, second, the results of tests to which he had requested a group of fifteen persons ignorant of the so-called art of “graphology” to give their responses. The results showed that sex could be determined from handwriting with an accuracy above that of chance. The percentage of correct judgments varied from 63% to 78.8%; under favourable conditions it rose to 90%.



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Figure 5. Handwriting of a man. The gender of this handwriting was recognized by all those who have studied it. In Binet (1906a, p. 13).

The professional graphologists made the higher scores. Crépieux-Jamin, who had divided his determinations into “certain” and “probable”, was correct in 78.8%, and Eloy in 75%, of their judgments. However, when questioned as to their criteria of differentiation, the experts could give no definite grounds for their conclusions. In a letter dated March 11, 1903, Crépieux-Jamin, by far the most skilled graphologist, tried to explain his method of classification (Klein, 2011, p. 280-282). He emphasized that, for sex, there were various indicators. Sometimes it was the psychology of the writer who informed him, sometimes it was directly the shape of the handwritten gesture. He appealed (a) to the neatness, simplicity, firmness of the man’s handwriting in contrast with the exaggerated, complicated, gracelessness, insignificance and incoherence of the woman’s; (b) to such graphic details as the superelevation of “r” and “s” in the handwriting of women. Simplification, which is a graphological sign associated with culture, is much more common in men than in women. The study of the reports written by Crépieux-Jamin also shows that the professional expert, confronted with a sample of handwriting of which he is trying to guess the gender of the writer, can often find several characters which sometimes confirm, but sometimes also contradict each other; in the latter case, it is not only necessary to count, but also to weight the characters, and combine them so as to derive a measure of central tendency. This work

is delicate and subtle, often full of conjecture. The explanations provided by Eloy were much less explicit than those of Crépieux-Jamin, because the graphological details on which the expert has to rely for his determinations were not indicated by Eloy. Concerning the non-experts in graphology who were asked to judge the samples of handwriting, they disliked giving explanations, did not want to perform the experiment, were not confident, and often claimed that they answered at random. Nevertheless the number of correct responses given by the non-experts exceeded 50% chance, without, however, reaching the number of correct answers given by the graphologists. They also gave nearly as great a proportion of correct answers as did the experts. For instance, a studious girl of seventeen was correct in 70% of her judgments. Four instructors and instructresses in the schools attained very good percentages (they were correct in 66% to 73% of the judgments). If it can be said that they have achieved a good level of graphology without knowing it, then for Binet graphology was not intuitive; the gift of recognizing sexual character in writing belongs to nearly everybody, but the ablest of the “ignorants” remained below the best graphologists.

All those who had agreed to guess the gender of envelopes recognized that, for some samples of handwriting, the operation was very easy requiring only a simple glance, while other samples were very difficult to judge; some specimens of handwriting were so difficult to judge that the observer was obliged to guess at random. In the addresses given by Binet to his/her subjects, three sorts of gender indication were noted: 1. handwriting which reveals to all observers the sex of the writer; 2. handwriting, the gender of whose author was ambiguous (responses are equally distributed between the two sexes); 3. handwriting that exhibits signs usually associated with the opposite sex. In the latter case, Binet showed that a skilful person could transform his/her writing to the extent that an expert made a mistake on the sex; furthermore, and this may be an important fact, when confronted with these graphic signs, that had been deliberately distorted, graphologists imagined a different intellectual and moral character than that normally revealed by the natural handwriting of that person.

Binet concluded his paper briefly by saying that gender-related characteristics can be discerned in handwriting. Graphologists perceive them; ignorants can perceive them too, though with less sharpness. This first article was very successful: “it is incredible how the public is interested by graphology! I am bewildered (amazed)” (Binet’s letter to Piéron, October 14, 1903, in Klein, 2011, p. 207).

3.2. Experiments on the determination of age in handwriting (January & February 1904)

Usually, graphologists are reluctant to determine age by relying on the interpretation of handwriting. Even l'Abbé Michon warned them expressly to exercise caution on this matter. However, Crépieux-Jamin had admitted that, as with the case for the determination of gender, handwriting can reveal information about the writer's age.

In this test concerning how age can be revealed (Binet, 1904a), the method and the materials were identical to the preceding experiments on gender in handwriting. So, for example, the 180 envelopes used in the first test were submitted a second time. These envelopes were almost all drawn in natural handwriting, and most were sent by post. Binet knew the people who wrote them; he knew their date of birth; and the stamp of the post office, printed on the envelope, gave him the date of mailing, and consequently the age of the correspondent at the time of writing.

The writers' ages varied considerably: the youngest was a girl of fifteen and the eldest an old man of ninety-three. Between these two extremes, could be found all the intermediate ages. It followed from this that the graphologists did not have to practice on very young children's shapeless calligraphy, nor did they practice on ten or twelve years old's awkward calligraphy, but only on those who wrote accurately when they were focused.

The calculation of the possible number of chance successes, as well as the elimination of sources of error, proved much more difficult in this than in the preceding test. How to eliminate the element of chance in determining age? To eliminate chance from the equation, the method is quite simple: Binet had to seek what kind of effect chance could produce by itself. The average gap between truth and age that could have been created by chance, could then be determined. If a graphologist did not exceed the average approximation provided by chance alone in his assessments, then it is clear that his judgment cannot be taken seriously. Binet did not attempt to calculate a theoretical value of chance gaps by the means of probability calculus. Why? Because he found out that the values of age given by the subjects were not distributed randomly but were massed around an average close to forty years old. This implies that average ages were cited more often than were very young or very old ages. This concentration around the mean was sufficient in itself to bring about the result, apparently a little weird, that the gaps on the extremes were larger than those in the middle of the series. Binet decided to calculate empirically the difference between the actual age of a person and the age assigned to this person by an expert. With the help

of Crépieux-Jamin's data, Binet calculated the average difference associated with a hundred gaps of this kind. The resulting mean was 15 years. This means that when one randomly guesses the age of the writers, one is likely to commit a 15 years error with a considerable range of variations (minimum = 0, maximum = 43 years). So whenever a graphologist failed to reach an average approximation of less than 15 years, he should be considered to have been unable to perceive graphical signs of age.

Envelopes were submitted initially to two professionals: Jules Crépieux-Jamin and Renée de Salberg. The average mistake in determination of age by Crépieux-Jamin was ten years, which is notably under the chance level of 15 to 16 years old. So this expert succeeded in perceiving the age of the handwriting to some extent, with a slight tendency to judge the age as being too young. The experimental results confirmed the opinion he had defended so far, when he had said that "handwriting has an age". Although this claim had not rested upon precise and controlled scientific observations, Crépieux-Jamin was able to distinguish between several handwriting styles. The young child shows a rough drawing, slow, clumsy and graceless, with words whose letters stay the same size or grow larger after a while. Adolescents have a more expansive drawing style, with many irregularities and pretentious shapes of which the rolled stem of the "d" is a good example. But their strokes are steady, crisp and have lost the typical childhood heaviness. Young adults show an even clearer handwriting style, freed at last from the rigorous shapes of calligraphy. The originality of character appears more clearly and the diversity in samples of handwriting is more noticeable than is the case in adolescence. Old age manifests itself in many different aspects, but it can easily be detected by a characteristic tremor, or by a downward handwriting with concave or convex lines. Many lines are curved, modified, and concave instead of convex, or are even reshaped into straight lines, which is an early sign of shaky handwriting. Other symptoms include: loose and blurry handwriting, with many deletions and so on.

Results obtained by Renée de Salberg seemed less convincing, because her average error (14.7 years) closely approximated chance (15 years). Binet thought nonetheless that she had not given her best as a graphologist with this task: she probably hadn't practiced enough at attempting to perceive the characteristic features associated with age. He noted, however, that she had a considerable ability to classify individuals by social level. In addition to these two professionals, samples of handwriting were reviewed by a dozen people unconcerned with graphology; these included school teachers, mundane people and children. Binet was curious to see how nonprofessionals could cope with this difficult task; the results showed that

some of them were almost as good as professional graphologists at guessing the age of people, from their handwriting.

Binet concluded that handwriting does to a certain extent reveal age, since both experts and nonprofessional observers were able to give judgments superior to those expected by chance. People unconcerned with graphology, but smart and dedicated nonetheless, were able to perform as well as experts. As with gender, certain specimens gave unmistakable indications of age; others, ambiguous indications; and others, evidence of an age, different from the real age. But age determination and gender determination were only the starting-points of Binet's research. Other features remain to be explained, including handwriting-based character portraits and indications of intelligence.

3.3. Does handwriting reveal degree of intelligence? (January & March 1904)

According to Roussel (1904) it was on January 14, 1904, at a SLEPE session, that Binet performed a new experiment on how intelligence might be revealed in handwriting. Several letters or fragments of text were glued onto cardboard, and those attending were asked to examine these fragments in turn. Each was required to designate on a ballot which letters seemed to have been written by people of average intelligence and which seemed to have been written by men of superior intelligence². It was specified that no importance should be attached to the meaning of the letter; the task was to study the handwriting only. The results obtained during this session were to be published in a new article be integrated into the SLEPE's *Bulletin* (Binet, 1904b). Samples of handwritings came from authors known for their superior intelligence such as: Claude Bernard, Edouard Pailleron, Paul Hervieu, Alexandre Dumas Jr., Victorien Sardou, and Jules Lemaître. After having summed the answers, Binet found that the samples from writers of average intelligence were judged to be associated with average intelligence 39 times and with higher intelligence 35 times. Similarly, samples from authors with superior intelligence were judged to be associated with average intelligence 44 times and with superior intelligence 39 times. In other words, there were 78 correct attributions and 79 inaccurate attributions. The results on intelligence were therefore entirely negative: they could be attributed to pure chance. It seemed therefore that those ignorant of

²This experiment, it seems, was not the first. In a letter dated December 17, 1903, Binet wrote to Faguet: "I just did a series of graphological experiments on superior men's handwriting." (cf. Klein, 1911, p. 286).

graphology were totally unable to deduce intelligence from handwriting. But this was only a presumption, for a deeper analysis of solutions showed that agreement was often reached on some individual samples of handwriting (Sardou, Poincaré and Claude Bernard) by a large majority. Therefore, if handwriting really did contain good signs of intelligence, as graphologists had seemed to claim, non-experts failed to recognize them every time using mere intuition. They were better at recognizing gender in handwriting, as an earlier experiment of the same kind had demonstrated. Binet felt justified in carrying out new similar experiments with graphology at this time. Here is what he said then: “These results are very interesting and I must say that they honor graphology. I wonder if they do not also present a serious pedagogical interest” (Binet, 1904b, p. 397).

In a paper published at the same time in *L'Année Psychologique*, Binet (1904c) summarized and expanded his previous claims published in *La Revue des Revues*, concerning gender and age as revealed in handwriting. For instance, relying on statistical data concerning gender in handwriting, he emphasized that women's handwriting is generally more difficult to recognize than men's (Binet, 1904c, pp. 202-203) and that a new handwriting examination by graphologists had not provided better results (Binet, 1904c, pp. 203-205). The new data presented by Binet focused mainly on the determination of intelligence. He made his participants compare pairs of letter fragments originating from two people he personally knew, but who differed considerably in intelligence. He had made sure that these people belonged to the same social environment, and that the content of the letters did not give away any relevant information. Graphologists performed this task very well. Given a sample size of 36 documents, some of them committed only 3 errors, whereas others committed 5 to 6 errors. These early results were promising. It did not seem impossible that graphology could provide experimental psychology with a *good intelligence test*. But he did not know at that time how non-experts would perform on this particular task. The SLEPE's Graphology Commission had already established a short questionnaire (see the *Bulletin* of January 1904) designed to demonstrate a difference in handwriting between smart and less intelligent children, and between docile and less docile children.

The conclusions of this report were discussed by Belot during the SLEPE session of June 9, 1904, and published afterwards (Belot, 1904). These were mostly negative. In a notice published in the SLEPE's *Bulletin* of July 1904, Binet pointed out:

It would be wrong (to say) that children's handwriting does not contain signs that may indicate their level of intelligence

(at least partly). This conclusion would be too hasty. It is prudent to wait a little more. It seems more likely that there is something true in graphology anyway. We can cite a fact that seems indeed to be in favor of graphology, although it does not fully confirm it: (I asked) Mr. Baudrillard and Mr. Belot to make their smartest and their least intelligent primary school pupils write some addresses. This collection of documents was submitted for examination by a large number of people, with an invitation to distinguish the most intelligent children solely on the basis of their handwriting. Many mistakes were made of course, as one would expect. But the exact number of correct determinations was consistently higher than the number of false determinations. Sometimes, the examiner made almost no mistakes. (Binet & Boitel, 1904, pp. 465-466)

Thus we learn that the first results (see Binet, 1906a, pp. 158-161) obtained by Binet on the disclosure of intelligence in handwriting were quite positive.

As a former lawyer, Binet was still sensitive to legal issues. Addressing the problem of judicial expertise, Binet wrote: "It seems to me that magistrates should not listen to an expert (even a sworn expert) unless his skill had been evaluated previously by methods analogous to those I have just proposed. It seems to me like an interlocutory question in a legal proceeding, and it doesn't lack importance. Experts should be appointed after a competitive exam consisting of practical tests capable of demonstrating their ability scientifically" (Binet, 1904c, p. 209). At the same time Binet was also particularly interested in judicial matters (Binet, 1904d; see Nicolas, Gounden & Sanitioso, 2014). Indeed, about five years earlier, he had established that the judge often brings about an involuntary suggestion when pressing a witness with questions (Binet, 1900). Acutely impressed by events to which he had been a witness, he wrote a note to say that here was a science waiting to be founded, the science of testimony, and he added that he was quite certain that the founding of this science would come soon, because of its immense utility. But his efforts failed, and one of the reasons for their failure was the inertia with which the administrators of the justice system opposed him. He noted that for his research on graphology he had asked the court to transmit to him samples of a murderer's handwriting. The answer he had received from a high-placed official was precisely as follows: "Murderers have paid their debt to society, and we can

take no measure that may damage their memory” (Binet, 1904d, p. 131). Binet added: “The only place that was rigorously closed to me was the prisons: Respect for the murderers!” He came to understand, therefore, that changing any practices in the domain of law was a long-term project; he had to accumulate scientific evidence if he were to expect a change in judicial practice.

4. A NEW BOOK BY BINET ON GRAPHOLOGY (1906)

It was in 1906 that Binet presented a summary of all the studies he had conducted on graphology over more than three years (Binet, 1906a). The purpose of this work was to ascertain whether handwriting could tell us anything about the intelligence or the character of those who wielded the pen. Graphology had so far only known blind faith or absolute skepticism. But Binet submitted it to a reasoned and scientific critique. In the introduction to the book, dated March 24, 1906, Binet wrote: “Here is a study that interested me passionately. I do not regret the long months it has taken me, or even the tedious paperwork it has imposed on me. To test graphology experimentally is one of the most beautiful experiences that a psychologist might wish.” (p. VII). This was the first attempt at applying experimental psychology to this area. Graphology stood the test less well than had been accounted by its fervent supporters, but it did better nonetheless than the most skeptics would have thought. Disentangling fact from fiction in the whole field of graphology constituted a huge task that was only partly undertaken by Binet himself. While he admittedly got involved with only a few problems, he did look deeply into them, using this rigorous method of his own devising. The method remained the same throughout his work: he first collected handwritten documents whose authorship he knew and, second, he submitted these documents to known graphologists and non-expert subjects. Throughout his research, Binet made it a rule not to meet personally with his graphologist and non-graphologist participants. He contacted his participants only by mail in order to minimize any unconscious suggestions from his words, gestures or attitudes. Dedicated to Mr. Brioux, the book is composed of 27 chapters, divided into 4 parts (for a review, see Frazer, 1906). Here only the last two parts of this book will be described, because the first two parts basically repeat Binet’s account of his previous work on gender, age and handwriting (Binet, 1903c, 1904a, 1904c).

4.1. Intelligence in handwriting

The third part of Binet's book is indeed new. It dealt with intelligence in handwriting (Binet, 1906a, pp. 45-172). Can graphology be a *test* (p. 45) of intelligence? For Binet, this question was of greater value than was the case for age and sex. Intelligence is at the center of the author's concerns at this time. The title of the tenth chapter is very suggestive: "Can we measure intelligence?" (pp. 45-55). As noted by Binet, the study of intelligence by graphology presents some technical difficulties: 1. the uncertainty of establishing the real degree of intelligence of people; 2. cues given by the contents of the letters; 3. recognition of some samples of handwritings by graphologists. Regarding the difficulty of determining an actual order of superiority, Binet selected twenty-seven names of intelligent people, amongst which those of Bergson, Henner, Dalou, F. Buisson, J. Simon, V. Sardou, P. Bert, T. Flournoy, T. Ribot, Marey, Laboulaye, Croiset, Mosso, Renan, Metchnikoff, C. Bernard, A. Dumas fils, Dumas (the chemist), F. de Curel, Poincaré (the mathematician), Brown-Sequard, J.M. Charcot, Brunetière, Lemaître, Ch. Rouget, E. Durkheim, M^{me} Ackermann. The group of people of average intelligence was selected with great discretion. They were persons without originality, whose intelligence contrasted strongly with the talent and sometimes the genius of the persons named above. "Readers will understand the discretion I have had to exert to divest them of unwanted attention; several are still alive, and several of them will read what I wrote; I want them never to know about the unfriendly use to which I have put of their writing" (Binet, 1906a, pp. 50-51). To avoid cues inadvertently provided by the contents of a letter, envelopes were first employed; but the experts objected to the insufficiency of the material because it provided too little information on which to judge the intelligence level. Out of 80 replies only 61% were correct. Binet then had recourse to personal letters, by cutting out the signature and certain key words, their meaning was obscured. The two methods of experimenting were: 1. by couples (each couple containing one writing by a great, and one by an average intelligence); 2. by collections, "A" and "B". In "A", handwriting specimens by 29 great were mixed with those of 4 very narrow intelligences known to Binet; in "B" a larger number of mediocrities were mingled with Renan, Bernard and Daudet. In the first case, the expert had to compare the samples of handwriting from two subjects who were described as showing really different intellectual abilities: Henri Bergson and a clerk of average intelligence, for instance; Ernest Renan and a fairly smart legal practitioner; Théodule Ribot (the painter) and a modest painter without much talent and with a mediocre mind. In the collection test, experts had to estimate

the intelligence value of each 20 to 30 documents and then divide these documents in two groups ranging in intelligence from mild to very high.

As he had done previously for the determination of gender and age-related features in handwriting, Binet addressed the experts, notably Crépieux-Jamin, who had revived, if not actually created, the graphology of intelligence. He recognized six degrees of intelligence: genius, talent and alert intelligence which constituted the three degrees of intellectual superiority; and mediocrity, insignificance, and low intelligence which constituted the three degrees of intellectual inferiority. In handwriting, genius manifests itself by power, clearness, simplicity and activity. The strokes are not of common form, but elegant, or well defined, with inequalities that do not jar the reader. Talent has the same signs, but with less clearness, simplicity and activity (signs of sophistication such as modifications of the ordinary forms of writing into abbreviations or simplifications, are as numerous as with genius.) Alert intelligence manifests itself by clearness and simplicity. Unevenness (an index of non-jarring intellectual sensibility) is great and gives the impression of a shudder of the pen. Precision is not so great as with genius. Indications appear that are absent from those of genius, for example, cunning, deception, versatility, and violence, which remain independent of each other. It is with mediocrity that we observe signs of incompleteness, gaps and discordances. For example, the characters are labored or verge upon vulgarity. There are also indications of meanness, clumsiness, exaggerations, inequality of the strokes, lack of harmony, and lack of clearness; there are few of the signs characteristic of culture. Insignificance can be seen in the infantile simplicity of the strokes, the lack of energy, activity, and signs of culture; the style is even and monotonous, with the spaces often exaggerated. Low intelligence manifests itself by vulgar, confused and exaggerated forms, with no evidence of culture. Crépieux-Jamin could write: "In sum, the major signs of superior intelligence are clearness, activity, inequality and simplification. Mediocrity can be recognized by discordances and incompleteness. Inferiority manifests itself by inactivity, vulgarity, and the absence of simplifications." (Binet, 1906a, p. 66). Nevertheless disagreement persisted between graphologists over what were the characteristic signs of intelligence. They did not believe in the constant value of even general signs. Signs of intelligence, as indicated by Crépieux-Jamin and other graphologists, struck Binet by their complexity and by the difficulty of arriving at acceptable interpretations about them. Binet underlined the necessity of defining graphological terms more efficiently, because graphologists disagreed when they offered

alternative interpretations for individual signs; graphology was based more on intuition than on objective reasoning.

What were the levels of performance attained by graphologists and by non-experts in graphology? In the method that used couples, graphologists were given 36 couples of handwriting to be examined, with 36 judgments to be returned. Seven experts gave answers. Binet said: "If we consider, for every couple of samples, whether the sample from the more intelligent writer was correctly identified by the majority of the graphologists, we note that the majority of the graphologists were correct 32 out of 36 times; in ten cases all seven were unanimous and correct; but in three cases the majority were wrong and selected the sample given by the least intelligent writer [...] Taking the overall average as representing that of an exceptionally good expert, we would thus credit him with only 3 errors out of 36 judgments, all the rest being correct. His average success would have been 90 percent" (p. 99) Handwriting, therefore, is uneven when it comes to providing evidence for the intelligence of the writer. While it is incontestable that graphic signs of intelligence exist, they are not necessarily found in the handwriting of all great intelligences. The case resembles that of physiognomy: "I have made similar remarks about faces. Intelligent faces have features that are clear enough to be recognized by many observers. But these features are not invariably owned, without exception, by smart people." (p. 100).

There were also differences in performance between expert graphologists; Crépieux-Jamin had the best hit rate, 91.6%. In 36 pairings of samples of handwriting representing intelligence and mediocrity, Crépieux-Jamin gave 33 correct and 3 incorrect replies. With the method of collections, experts had to express the intellectual value of a sample of handwriting as a number, directly and without comparing it to another sample. Errors were more frequent than in the couples experiment. Without denying the fact that comparing samples of handwriting helps the graphologist, Binet surmised that the results from the first experiment might have more than one explanation. For instance, its results could be explained by the fact that experts merely rely on comparison instead of a numerical judgment when he is not asked to provide the latter. Furthermore, its results could have been caused by the graphologist's previously noticing a difference regarding the respective intelligence levels of the two samples. "If one is almost certain that one of the samples of handwriting shows few signs of intelligence, it helps to assume that the other sample had been supplied by an intelligent writer." (p. 108). Binet says: "Reading a series of graphologists' opinions, one is alternately charmed by their accuracy and disgusted by their errors. One cannot decide whether or not there is any truth in

graphology except by taking the average of those efforts, which answers the doubt affirmatively". When Binet said to Crépieux-Jamin there were errors in certain pairs (Binet had given false information), this expert graphologist refused to change his judgment of the superiority of Renan's intelligence to that of a small provincial lawyer (on the contrary, he raised the index of Renan and lowered that of the other). "This experiment argues well for graphology", said Binet, but other graphologists fell into the trap and recanted all they had said, incapable of resisting Binet's false assertion.

As in the study of sex and age in handwriting, Binet (1906a) exposed to non-experts in graphology samples of handwriting provided by people of various intellectual capacities. Masters and mistresses in four communal schools selected ten of the brightest and ten of the dullest pupils between twelve and fourteen. Three types of experiments were completed: 1. postal addresses written by schoolchildren; 2. fragments of letters written by known and unknown people; 3. samples of handwriting presented in pairs. Binet first described experiments conducted at a session of the SLEPE in 1904 (Binet & Boitel, 1904). 80 envelopes, containing addresses dictated to the pupils, were submitted to 16 persons, 3 professionals and 13 teachers. The majority of these persons agreed with the rating of the child's instructors in 57, but differed in 20 cases. In 5, the agreement was unanimous; in 6, the majority was 17 to 1; in 10, the majority was 17 to 2. Thus intelligence appears to have been estimated from a child's handwriting. Asked to define the features on which they relied for their opinions, the most frequent replies were: a) place and dispositions of words, specification, disposition of the address; b) accuracy or clumsiness, precision, decision, firmness, energy of the characters. In the same task the graphologists were not superior to non-experts, since the graphologists who tried to analyze these same documents only succeeded in 60 to 65.5% of the cases, whereas non-experts succeeded in 64.4% of the cases, with some non-experts obtaining scores of 72% (a teacher and an engraver). Binet also recalled previous published results (Binet, 1904b) showing that samples of handwriting from famous people could demonstrate the graphological ability of some non-expert subjects. Even though most of their judgments were less precise than those of the graphologists, some of them showed unquestionably that non-experts were able to "read intelligence" in a sample of handwriting, or at least, were able to recognize some of its graphical signs. Victorien Sardou's handwriting in particular was identified as superior by all 12 persons (p. 163). Differences of opinion, however, were found concerning the handwriting of many other personalities. Nevertheless, Binet concluded that signs of intelligence in handwriting were sometimes so obvious that even non-experts could

perceive them. In experiments performed on handwriting pairs (Binet, 1904c), non-experts were less likely to perform this task effortlessly than were graphologists, even though some people performed better based on their intuition.

In conclusion, Binet (1906a, p. 168) said: “Yes, I can now declare that there are signs of intelligence in handwriting; these signs frequently have a particular value, but it is not always constant; the non-expert in graphology can perceive them, but not as well as professionals.” (p. 168). Indeed the “ignorants” can comprehend these signs, but less well than can the graphologists. It is possible for some graphologists to read intelligence in handwriting, but the graphologist’s method is not infallible.

4.2. Character in handwriting

The fourth and final part of Binet’s work (1906a) discusses the question of “Character as revealed by Handwriting” (pp. 173-257). After some trial and error, he restricted his efforts to major criminal case studies; the experiment seems more decisive in this fashion. He then mixed the samples of handwriting from eleven great French criminals (ex. Vidal, Eyraud, Nougier, etc.) and fourteen honest people known to Binet. He asked expert graphologists (Crépieux-Jamin, Vié, Eloi, Paulhan, Varinard and de Salberg) to provide portraits of the writers of those samples, with a particular emphasis on feelings, highlighting the moral qualities of goodness, tenderness, gentleness and altruism. The experts had to work on various documents, varying in length and style. The minimal length of the text was however always fixed at eight lines, and its topic could be varied (Binet used pieces of cardboard to cover parts of the assassin’s revelations that could have been too easily recognized). Binet only knew about these criminals through expert reports, indictments, newspaper reports containing a summary of court proceedings, etc. Two methods were used. The first consisted in comparing the writer to his graphological portrait in order to decide if that portrait was accurate. The second consisted in mixing samples of criminal handwriting and those of honest people, and then asking the graphologist which one came from a criminal and which one did not.

One of this book’s longest chapters presents “A gallery of assassins judged based on their handwriting” (pp. 196-235). Binet published assassins’ portraits as they had been drawn by graphologists on the basis of handwriting analysis. Some of these portraits were very well done. Crépieux Jamin described Michel Eyraud (1843-1891), assassin of bailiff Augustin Gouffé (1840-1889) (see Nicolas, 2004), as “an intelligent and active man,

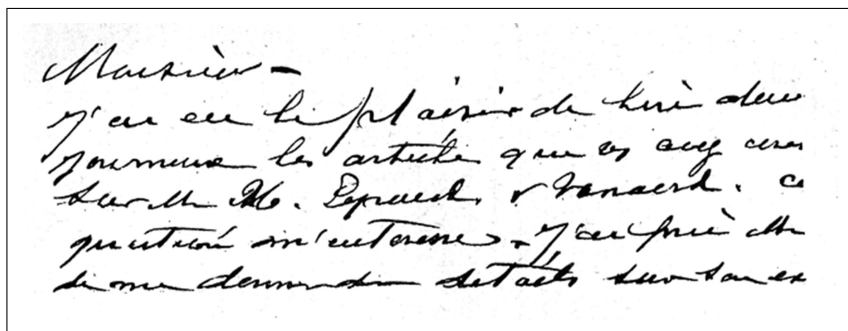


Figure 6. Handwriting of Michel Eyraud (1843-1891), assassin of bailiff Augustin Gouffé (1840-1889), see Binet (1906a, p. 217).

but somewhat untidy. Someone very passionate, intense in everything he does. His character is hard, over-hasty, irritable, excited, and nasty. He is therefore capable of violence. I find him poor in honesty and even worse if his health is not affected” (Binet, 1906a, p. 219).

Henri Vidal (1867-1906), a famous assassin of women (in 1901) was portrayed by Binet as cunning, cowardly, hypocritical, vindictive, boastful, lazy, violent, with low intelligence. The following diagnosis of Vidal’s character from his handwriting by Crépieux-Jamin is here given in its entirety in the translated words of the writer [Vidal] because it is the fairest test of the claims of graphology (the words in parentheses refer to the writing, the other to the writer). Crépieux-Jamin says:

Vivid imagination without grace (inequalities in direction and size, faulty capitals, backhand, large discordant movements, letters too high) associated with an activity of a low order in which agitation (unevenness in size and direction, etc.), discontinuity (words and syllables telescoped together, retarding movement), mediocre (vulgar without relief) and superficial (hesitating, rounded, without relief). He deceives and procrastinates (uneven size, discordant spacing), and hidden purposes lie behind his expansiveness (back handed and sober with large discordant movements). Lying, based on too much imagination, is habitual (very uneven size and direction, sinuous and hesitating, raised too much). Lacks reliability (very uneven size and direction, without relief). He

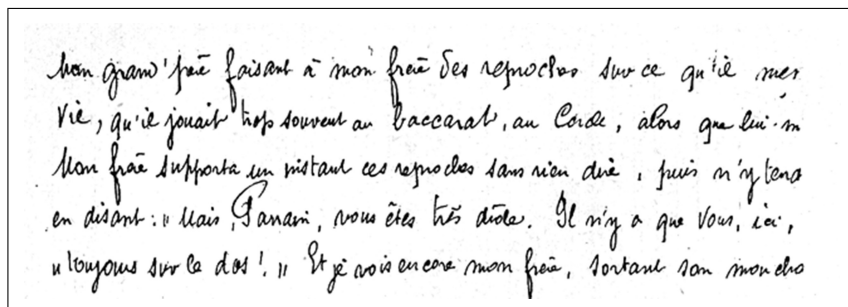


Figure 7. Handwriting of Henri Vidal (1867-1906), a famous assassin of women, see Binet (1906a, p. 199).

is neither generous (backhand and studied soberness) nor good (backhand, turning left, letters too high), but selfish. He is proud (too high), not incapable of accidental heroism. He has feeble energy (“t”s feebly crossed if at all, hesitating, slow and uneven) and he is inconsistently gentle and violent (curves with many discordances), or sensual and lazy (thick letters, heavy strokes). In sum, a nature unbalanced. (Binet, 1906a, pp. 200-201).

Binet praised the portrait but thought it did not go far enough. Other graphologists had offered portraits that were terribly vague or even false. Vidal, the killer of women, has been presented alternatively (by other graphologists) as a young girl capable of affection and altruism, as a teenager filled with emotion, and finally as a “thinker” whose handwriting might resemble that of Taine. So the appreciations of the graphologists often contradicted themselves.

In the chapter dedicated to “the measuring of an individual’s skill”, Binet (1906a, pp. 236-249) was more particularly interested in the performance of Crépieux-Jamin. He was asked to arrange twenty-two samples from good and criminal persons into four categories of good, medium, wanting and inferior. In the first class he put one good person. In the second he put three murderers and two good persons. In the third class he put one murderer and two good persons. In the fourth he put seven murderers and two good persons. Dividing the names into two classes, he had seven good persons and four criminals in the first and four good persons and seven criminal in the second. Arranging the names by pairing one good person and one criminal and then asking his judgment as to their comparison with each

other, Crépieux-Jamin was right for eight of the pairs and wrong for three. In this new experiment, Crépieux-Jamin had a 73% success rate, but the results obtained with the other graphologists (a 64% success rate) brought Binet to the conclusion that graphologists can not decide character as well as they can intelligence, and it is not clear that they ever will. “Let us admit that the graphology of character, particularly that of goodness, may possibly improve, perfect, and match the precision which the graphology of intelligence has already achieved. Let us hope for it; but let us confess that, for the moment, it is still only a dim light on the horizon” (Binet, 1906a, p. 249).

In the final chapter of his book, Binet (1906a, pp. 250-257) pointed out that his graphological works are interrelated with his previous research: they were a link in a chain; they were the fragment of a larger whole, to which he gave the name “outer signs of intelligence” (p. 250). He had already published some analyses of other signs of intelligence, for example, measures of the volume of the skull (Binet, 1901d). In 1906, he also had other studies in preparation including one on the significance of physiognomy (Binet, Simon & Vaney, 1906), and another on the value of chiromancy (Binet, 1908). For Binet (1906a), “there is some truth in graphology, cephalometry and probably in chiromancy” (p. 251). He had already glimpsed that other work was waiting to be done on how intelligence can be revealed by gesture, intonation, vocabulary, syntax, etc. Binet underlined three important points. First, although there is some truth to the claim that the judgments of graphology are veridical, it is unfortunately difficult to measure, because there is considerable variability that depends on the document presented and on the competence of the expert in graphology. Second, although there exist general indications in handwriting that correspond to intellectual or moral qualities, the relationships between these indications, intelligence, and personality are not spelled out. The links between signs and intelligence or character can be misleading. Thus graphology remains a fallible art. Third, graphology must cease to be an art in which everything takes place by intuition; graphology had to be open to scientific research. Binet offered his assistance because he claimed that graphology “is an art of the future” (p. 257).

5. THE CRITICAL ACCEPTANCE OF BINET’S WORK ON GRAPHOLOGY

A few months later, Binet (1906b) commented on the content of his work with these words: “I found very skilled graphologists, conscientious and loyal, who assisted me in my research, and who have never hesitated to

bend to my needs when required to by the scientific investigation. I have submitted them, I confess, to really demanding tasks; I tried to trap them and I have used suggestion on them; and I have sent them, without warning, samples of handwriting by criminals and fragments from people sentenced to death, asking them to inform me about these peoples' character. It follows from my research that an adult's intelligence appears quite obviously in his handwriting; but it is not the case, however, concerning the adult's morality." The Graphology Society (1906) would carefully examine the content of Binet's book and would conclude afterwards that Binet counted neither as a friend nor as an enemy of graphology. However the publication of his book was followed by a vigorous controversy with some graphologists who accused him of having mostly ignored the scientific contributions of graphology, especially the fundamental graphic laws which had not yet been tested (e.g. Pellat, 1907). Graphologists consider graphology as a science practiced skillfully by experts. What will the non-graphologist critics think about that?

5.1. The opinion of one of Binet's commentators: The psychologist Henri Piéron (1906)

Binet's book (1906a) received extensive commentary, although most of the objections to it were to be obliterated by the facts. One of the most famous papers of the time had been published on November 19, 1906, by the young Henri Piéron (1881-1964). Piéron had not yet become one of the most famous French psychologists of his generation (for a biography, see Nicolas, 2002). He was then secretary-general of the *Revue Scientifique* which was then directed by a fierce enemy of Binet: the psychiatrist Edouard Toulouse (1865-1947).

The first series of criticisms was relayed by Piéron (1906) in his critical paper. These comments concerned the question of how intelligence could be related to the coarseness of the strokes of a pen. Handwriting consists in a series of delicate movements, performed by fingers and wrist, creating little drawings called letters, then words. These movements are so clumsy and awkward at first that they require attention and constant eye focus, but they become more or less automatic with practice. Moreover, each individual has its own style of handwriting. One has one's own handwriting, just as one walks a certain way, and we are able to recognize someone's handwriting as readily we are able to recognize someone's silhouette. For Piéron (1906), an individual's handwriting corresponds to that individual's mentality (*cf.* Huteau, 2004), but this individuality doesn't

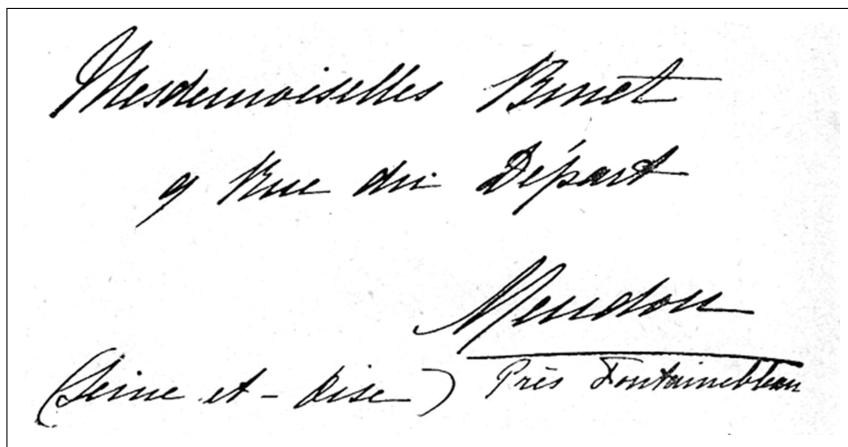


Figure 8. Angular handwriting, called “Sacré-Coeur”. The address was written by a 19 years old girl. The gender of this handwriting was always recognized, but it was not the case with age since subjects thought that this was a handwriting of an older person. In Binet (1906a, p. 16).

prevent mistakes. He emphasized that graphologists lack the degree of efficiency that could give to their art the status of a science. If graphology isn't a science, then we should avoid it. “Justice seems to have taken only one aspect of handwriting seriously, the one that consist in the recognition of an author through their handwriting. But graphologists' mistakes, their ignorance, and their complacency, have provoked public ridicule, and rightly so” (Piéron, 1906, p. 616).

A second series of criticisms questioned the fact that intelligence could be distinguished from a plethora of parasite variables such as the shape of the pen stroke, the type of ink and the quality of the paper, the strength of the muscles, the dexterity of the hand, the imitation of other types of handwriting, the importance of readability, the influences of trends in fashion, snobbery, etc. It is true that these intentional deformations can make the expression of one's personality really difficult, because that expression only appears in automatic movements made by one individual. A particularly striking example of this “mindless” style is found in the writing of the famous “Sacré-Coeur” (although the time can come when this impersonality can even appear as a personal characteristic).

Finally, a third line of criticism concerned the concept of “intelligence” itself. Piéron (1906) considers that we cannot measure intelligence in handwriting, because so-called “intelligence” doesn't exist at all. The

concept of “intelligence” can bring together a large number of abilities without any common benchmark (see however Spearman, 1904). For Piéron, there are only different types of intelligences (see Huteau & Lautrey, 1997; Gerrig & Zimbardo, 2008 for an historical summary of this topic). In order to avoid methodological controversies, Binet had been using a by-contrast method: he would compare samples of handwriting provided by higher intelligent authors with those of ordinary persons. By asking participants to rate one against another, he had concluded that graphologists performed this task better than did non-experts, as described above. But Binet had already stressed in his investigations of individual psychology (Binet & Henri, 1896) that different types of intelligence existed, among which two of the most important were the observational and the imaginative. Binet (1897, 1903a) foresaw that this distinction between the two types, the observational and the imaginative, could form the germ of a classification of mental attributes that might hold an important place in experimental psychology.

In concluding his study, Piéron wrote: “The sole study of handwriting, taken as a bundle of shapes, seems to me quite fruitless. Handwriting study should not be considered as a branch of the psychology of movements, especially the psychology of these movements that leave a long lasting mark, making them easy to study. Handwriting study should not aim too high. Indeed, even if it did give us some useful data, it wouldn’t help us to understand intelligence or character, as those graphologists who display an occultist’s arrogance might assert.” (Piéron, 1906, p. 622). There are no certain, constant, or necessary signs in graphology that could help us to draw psychological portraits. Piéron wrote that some graphologists could as easily take an assassin for a good man as they could take a woman for a man. Many also fell directly into the traps set by Binet. Although we should not use these blunders as definite grounds for rejecting graphology, these facts combine to set up a real distrust in the pretentious knowledge of some graphologists, and a sense of failure that any scientific analysis of handwriting can constitute a science. Piéron ends his text as follows: “I will conclude with Mr. Binet that graphology is a fallible art, but I will also add that it is an art without a future” (Piéron, 1906, p. 622).

5.2. The opinions of yet another commentator on Binet: The mathematician Emile Borel (1906)

On December 1, 1906, Binet sent the following reply to Piéron on receipt of Piéron’s critical paper, that had just been published: “I would like to

thank you for this paper. It seems to me really well written, and what you've pointed out about correlation is absolutely correct, I've been thinking about it a lot lately. However, it seems that you were influenced by Borel's comments, and perhaps you are too skeptical about the link between graphology and intelligence. I've been conducting further research, and I hope to have avoided the cause of the error he rightfully pointed out previously. My results stay the same, with a strong percentage in favor of graphology." (see Klein, 2011, p. 213). Indeed, it seems clear that Piéron had indeed used objections written by Borel (1906a) in an earlier paper: 1. Graphology as a science doesn't exist, but some people pretend to be graphologists (all positive results have been provided by a few talented people, such as Crépieux-Jamin); 2. We cannot measure this ability nor can we determine whether it could be transmitted through precise rules. We cannot know if this ability depends on the memory of a massive number of different samples of handwriting either; 3. The positive results obtained by Binet could have been a consequence of uncontrolled variables. This last claim would lead to a debate between Borel and Binet.

The mathematician Emile Borel (1871-1956) had read Binet's book (1906a) on graphology with great interest. Director and founder of the *Revue du Mois*, he had informed Binet on June 24, 1906, about his mathematical interest in Binet's idea that "a majority of a group of graphologists constitutes something like an ideal graphologist" (Binet, 1906a, p. 169) and that he would soon talk about Binet's book in his review (cf., Klein, 2011, pp. 289-294). Borel's (1906a) paper was published on August 10 of that same year. The author observed that the most interesting part of Binet's book concerned the determination of intelligence on the basis of handwriting. This part was also the most positive for graphology. Borel wondered if Binet had not been influenced by the graphologists he had met during his experiments when he argued that intelligence could be easily determined with the use of handwriting. The novelty in Borel's paper is a new experimental objection: the text of the letters used by Binet gave a good insight into their writers' intelligence, even though Binet had tried to avoid this problem by masking certain characteristic words. Indeed, the fragments used by Binet seemed meaningful to Borel, both in content and style, so meaningful in fact that they could have provided useful cues to the graphologists. An intelligent man doesn't write the same way as an ordinary man: even a simple sentence is labelled by elite intelligence.

Borel tried to confirm his suspicion by designing a control experiment. He printed out some of the fragments used by Binet and asked the readers of the *Revue du Mois* to guess which ones had been written by intelligent people, basing their guesses only on the content of the fragments. Borel was

right, almost all the people who answered guessed correctly. By calculating the percentage of correct answers (Borel, 1906b), he found that their score was not significantly lower than the score provided by skilled graphologists, who could have been guided both by the content of the fragments and by their graphics. Forty-one people responded to a questionnaire sent by Borel that incorporated 12 texts written in lowercase characters, amongst which 6 had been composed by elite personalities. Based on the calculation of probabilities, a subject had 1 chance in 924 of giving answers that were all completely accurate. The results showed that, for the 41 subjects, there were 4 correct answers, 17 replies with one error, 14 replies with two errors, 5 replies with three errors and one reply with four errors (i.e. a total of 64 errors for 246 votes). So the error rate was about 26%: a result that Binet would have qualified as being remarkable for professional graphologists, even though they were obtained by 41 *Revue du Mois*' readers, ignorant of graphology. The result is even better if we take the majority vote as an index of the truth: there are 5 exact results out of 6 (83%), meaning that the six superior men were ranked in the top seven places. In summary, the results obtained by the *Revue du Mois*' readers were better, at first glance, than those obtained by graphologists, even though the majority method had revealed a 92% success rate among those professionals. Borel concluded his article by saying:

It seems to me essential to emphasize the danger for the courts if litigants' honor is entrusted to experts who know nothing about scientific methods, and whose error rate, the one they almost always ignore and smugly deny, is at least 40%, even accepting Mr. Binet's sometimes too optimistic conclusions. If the work of the eminent psychologist has as a consequence an increase in distrust in graphologists, by specifying the low value that can be attributed to their opinion, he has rendered great service and its author need not regret the time he spent on this work. (Borel, 1906b, p. 369)

5.3. Binet's answers to his critics (1907)

In a letter published in the *Revue du Mois* of November 10, 1906, however, Binet (1906c) thought that the new facts assembled by Borel did not disconfirm his optimistic conclusions about the talents of graphologists. Indeed, for Binet, the contents-test given by Borel (1906a) was not

comparable to the original examination which he himself had applied to graphologists such as Crépieux-Jamin. For example, Borel (1906a, 1906b) had put 12 texts to the test, whereas Binet's original experiment had included 72 texts. For the contents-test to be conclusive, it would have had to be performed on all the texts used. In addition, Binet had given his participants a judgment task using pairs of handwriting fragments (Borel had used a multiple choice method where 12 texts were presented at the same simultaneously). Finally, Binet had indeed take precautions regarding the collection of his materials, contrary to what Borel seemed to have insinuated. Indeed, the selection of the texts had been entrusted to a reliable person whose task had been to guess writers' intelligence relying on the content only. This person had an error rate of 44% (while Borel's 41 readers had an error rate of only 26%). Binet admitted that he should not have relied on the performance of a single subject, but should have assigned this task to a group of subjects instead.

In July 1907, Binet (1907) published his final article on graphology; it was entitled *A crucial experiment in graphology*. Having thought for some time about how to design new experiments that would support his claims, he had come to the conclusion that it was not feasible to ask really sharp people to judge the origin of the 72 texts one more time. Because this task would have required a lot of time, few people would have agreed to get involved. Binet, therefore, attempted to circumvent this difficulty by asking Crépieux-Jamin to serve in an experiment he hoped would be decisive. Aware of having used texts with too much meaning, he decided to use addresses on envelopes as the experimental material. Those envelopes were presented in pairs and were written by writers whose intelligence levels were highly varied. Having worked hard to construct this ideal material, he assembled 28 pairs of envelopes with a maximal intellectual difference between each member of a pair. Binet warned Crépieux-Jamin that this experiment would be extremely difficult and that Binet would not allow him to deploy all his resources on graphology because judgments were to be arrived at only from addresses not much longer than 10 words. In order not to put Crépieux-Jamin in too constraining a situation, he allowed him to put aside all pairs of envelopes for which he could not reach a judgment with certainty. Out of the 28 envelopes, he was able to keep 21 for evaluation. The results showed that he had committed only one error, meaning a 95% success rate (he even managed later to replicate this error when only 4 pairs were presented!). Further experiments also confirmed Binet's assertion that "There is a sign of intelligence in handwriting [. . .] An expert such as Mr. Crépieux-Jamin can detect differences in intelligence with a reliability that comes close to infallibility" (Binet, 1907, p. 31).

In a final series of experiments, Binet wondered if social differences between writers were not a determinant of Crépieux-Jamin's performances. Let us suppose that there are social fashions in handwriting just as there are in clothing: it might be possible that small shopkeepers would choose to embellish their handwriting, whereas university professors, members of the Institute, would stick to a more sober handwriting. To control the potential role of social inequality, Binet used pairs of addresses written by school teachers with unusually different intellectual abilities. The results showed that non-experts in graphology were unable to give a correct judgment (50% correct responses, i.e. the chance level), whereas Crépieux-Jamin was able to establish an intelligence hierarchy in 70% of the cases. Thus, even under very difficult experimental conditions (brief documents, identical contents, etc.), Crépieux-Jamin succeeded brilliantly on this test, even though his errors reached an unusually high level for him. It is quite likely that, if the social status of the writers were made more uniform, any graphic differences due to intelligence would become weaker.

Binet (1907b) concluded his article by noting: 1. That a good graphologist can distinguish the handwriting of an intelligent man from the handwriting of a less gifted person, even in the case where the content of the text cannot help him; 2. Any graphological indicator of intelligence depends not only on its writer's intelligence, but also on his social condition; 3° The art of the graphologist, despite its intuitive character and its often irrational and unconscious nature, can be learned. After receiving an elementary lesson, even children³ are better able to recognize intelligence in handwriting.

6. CONCLUSION

Binet never treated with graphology with ignorance and contempt, for he thought that, insofar as it was true, it could be really useful. To form an opinion, he was the first to submit graphologists, especially

³About graphology with children, Binet wrote: "Thanks to the kindness of MM. Baudrillard and Belot, I was able to gather samples of writings from 80 children, boys and girls, of whom 40 are smarter than average and 40 are less intelligent. These documents were submitted to handwriting professionals and teachers, with the task of ranging them in two groups. In order for the style, the spelling and the ideas not to serve as clues, all children had to write three envelopes under dictation. Well, there have been large and notable mistakes made by all those who have tried to read the intelligence of children in their handwriting, but despite these errors, and taking into account the role of chance, we did find something. Professional graphologists achieved only 60 to 65% correct diagnostics. Some teachers were up to 70% or 72%, which is a clear evidence that even children's handwriting contains some signs that allow to know how smart a child is: but these signs are not infallibles". (Binet, 1906b, p. 185)

Crépieux-Jamin, to rigorous scientific controls, in order to assess, on an experimental basis, what was true about graphology. We have seen throughout this article that Binet was actually a defender of graphology, even if he was aware of its limitations. But he was especially impressed by the performance of the most famous French graphologist of his time: Crépieux-Jamin. He saw in him an exceptional subject. For Binet, it was essential that we understand the psychology of these kinds of highly gifted subjects particularly, for their study also provides information about psychological functioning in normal individuals. The method that consists in studying exceptional cases became the hallmark of Binet's research from an experimental point of view (cf., Nicolas & Saniotoso, 2012). A few years earlier, he had undertaken extensive research on the psychology of other kinds of exceptional subjects, the most emblematic example being certainly his work with the mathematic prodigy Jacques Inaudi (Burman, Guida, & Nicolas, 2014).

Crépieux-Jamin was undoubtedly one of the greatest graphologists of his time. Starting from Michon's integrative approach, Crépieux-Jamin ended up with a holistic approach to graphology. In his writings, Binet pointed out how well he thought of him and of his ability to analyze handwriting. Crépieux-Jamin's many works have persistently attempted to raise graphology to the status of a rational science, and several of his books had this explicit goal, including: *Le Traité pratique de graphologie* (Crépieux-Jamin, 1885), *L'écriture et le caractère* (Crépieux-Jamin, 1888), *La graphologie en exemples* (Crépieux-Jamin, 1898a), *Les bases fondamentales de la graphologie et de l'expertise en écriture* (1921), *Les éléments de l'écriture des canailles* (Crépieux-Jamin, 1923), *L'âge et le sexe dans l'écriture* (Crépieux-Jamin, 1924) and the famous *ABC de la graphologie* (Crépieux-Jamin, 1929). Considered a classic, we can still find versions of this book in French bookstores (Crépieux-Jamin, 2004), as well as books on graphology that claim to have inherited its teaching (e.g. Desurvire, 2005). Graphology, as a method of personality study, received a favorable reception from many great French psychologists including Pierre Janet (1928, 1937). Binet (1906a) considered that there was a certain truth to graphology, having been convinced of the merits of this approach by his collaborations with Crépieux-Jamin on research concerning gender, age and intelligence determination from handwriting. But he wanted graphology to adopt a scientific approach rather than an intuitive one, and the research he had done on the study of character had showed him the limits of graphology. Graphology, however, is being highly criticized by current psychologists, for example Huteau (2004), who refuse it the status of a science because there has been lack of validity in the

results reviewed by Allport & Vernon (1933), Fluckiger, Tripp and Weinberg (1961), and Dean (1992). Moreover, the *British Psychological Society* now ranks graphology alongside astrology—giving them both “zero validity” in determining someone’s character. Although it has occasionally been used for the recruitment of personnel (Greasley, 2000; Marchal, 2005; Steiner & Gilliland, 1996), graphology has been especially criticized for not relying on an objective characterology. If there is any evidence that indicates a link between handwriting and personality, we do not know today what it is (Huteau, 2004).

Graphology has had many followers and great ambitions for over a century now. Handwriting experts have sometimes been elected as advisors in court cases and their verdicts have undeniably been influential in some cases. At the end of the nineteenth century, Dreyfus was an iconic victim of amateur graphologists, although he was rehabilitated thanks partially to second opinions given by professional graphologists. If the judiciary still uses graphologists in some cases, graphology has not been used in schools to learn about children and to aid in the direction of their education. A proposal along these lines was made by Edmond Solange Pellat during the SLEPE meeting of January 8, 1903. Pellat would also found, in 1914, the *Société Technique des Experts en Écritures*, whose associated school would be located in the Sorbonne. This society enjoyed great prestige both in France and abroad. Pellat was also the first to sharply distinguish between graphology and handwriting expertise, which is an investigative technique aiming at assigning a manuscript to its writer, whether for legal identification of the author of an anonymous document, or for the historical attribution of manuscripts. We know from a letter dated December 14, 1907, addressed to Louis Havet (1849–1925), professor at the Collège de France and defender of Dreyfus’s cause, that Binet wanted to submit graphologists to an aptitude test: he had started a movement to ask the Ministry of Justice for the regulatory control of handwriting experts (see Klein, 2011, p. 249). But this demand, despite its obvious interest, never resonated politically. However, it could have ensured the selection by scientific means, of better graphologists and the dismissal of charlatans. It was perhaps because of a lack of support from the political side that Binet did not further pursue the research on handwriting expertise that he might have initiated.

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