

Reconstructing historical egocentric social networks in malacology: can eponyms serve as a proxy for contacts?

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Abstract

During the 19th and 20th century eponyms have been widely used in taxonomy to honour collectors of material on which new taxa have been based. Also have new taxa been dedicated to author-colleagues. Five cases are discussed to trace the extend of overlap between eponyms and known contacts of the author, using different sources of historical data (source publications of the author, provenance data in collections, correspondence archive, reprint administration). Authors have had personal preferences in the extend to which they dedicated eponyms to persons they were in contact, either indirectly (field collectors) or directly (field collectors, cabinet collectors or collegial authors). Eponyms named after a person who is known to have authored malacological papers strongly suggests that there was contact between the two authors (correspondence and/or exchange of material). If eponyms were given in reciprocation their contacts were likely to be relatively strong. Eponyms may be used as a proxy for contacts of the author if the contextual information is taken into account.

Key words: nomenclature, eponymy, science networks, history of malacology

Proper names are poetry in the raw.
Like all poetry they are untranslatable.
(Auden, 1970)

Introduction

Generally speaking, an eponym is a person, place, or thing for whom or for which something is named, or believed to be named. And although discoveries, phenomena, theories, etc. have been associated with e.g. a certain person, historians of science often may come to the conclusion that it was known before or discovered by another person (Wikipedia, 2016). Eponymy has been widely used through history, and eponyms are known from different disciplines but in science eponyms are mostly used in medicine and biology. In the latter discipline it is mainly used in taxonomy, and for some groups even eponym dictionaries are available (e.g., Beolens et al., 2009, 2011, 2013, 2014). Eponyms for persons have been applied since the beginning of binomial nomenclature as a way to recognise esteemed colleagues or to reward an ardent collector of material. Nowadays eponyms are sometimes considered as antiquated, as more emphasis is being laid on having the name reflecting characteristics of the newly described organism. While in medicine recently Fargen & Hoh (2014) have explored the arguments for and against the continued use of eponyms within medical education and practice, no such explicit debate has taken place in biological taxonomy. Eponyms have been used in taxonomy since the introduction of binomial names by Linnaeus (1758), and in the context of this paper we will focus on its application during the 19th and early 20th centuries within malacology (the study of shell-bearing animals).

Shells have been of interest to humans for millennia, and shell collecting came into vogue with the so-called 'curiosity cabinets' during the 17th century. From that time the study of shells

(conchology; later broadened to malacology) became more and more fashionable. While this was at first a privilege for the wealthy, later lower social strata became involved with shell collecting (nearly all people still being amateurs), until around the turn of the 19th/20th century professionals became more and more dominant (Breure, 2016). During the 19th century, the core of malacological activities was in Europe, with an emphasis on France, Germany, Italy, and England. Other parts of the world (mainly U.S.A.) had in that epoch only a limited number of authors in this field. Species descriptions and other taxonomical papers were published in journals of learned societies, until around 1850 specialised journals were started in France (*Journal de Conchyliologie*) and Germany (*Zeitschrift für Malakozoologie*). Historical studies in malacology have focussed nearly exclusively on biographies, bibliographies and lists of new taxa described by individual malacologists (Coan & Kabat, 2016). And although the role of historical science networks in biological sciences has received some attention (e.g., Marples & Pickering, 2016), not so within malacology. No in-depth studies on contact networks of individuals nor studies of coherent networks have been published. In biographies and overviews of new taxa published by an author, usually no attention is given to the contact networks of these authors (but see van der Bijl et al., 2010; Breure & Tardy, 2016). Archival studies have been limited to biographical data, and correspondence archives of malacologists are very scarce and ill-explored (Breure, 2015). Preliminary studies of correspondence and reprint archives (Breure, 2015, 2016) have shown that a three-fold distinction may be made in the development of contacts between two scientists, resulting in the following, nested categories: (a) the exchange of ideas (through correspondence or meetings), (b) the exchange of material (i.e. dry shells or preserved molluscs), and (c) the exchange of formal knowledge (i.e. in publications and reprints). It is only in the last category that eponyms could give an indirect indication of their contact in the case where archival sources are poor.

The reconstruction of a historical science network, in this case for European malacology, heavily leans on good archival sources and the possibility to reconstruct the egocentric social networks (or, in the terminology of social network research, egonets) of a number of key players in this field. Ideally the complete correspondence of a person is available, but in historical studies also a (partial) incoming letter archive is rather the exception than the rule. Personal meetings between malacologists have rarely been recorded, and usually have to be inferred from their geographical location (a close geographical distance is then assumed to have lead to personal meetings) or indirect sources (e.g., membership of the same society). Meetings may also have been indirectly referred to in letters, but so far this has been seen in relatively few cases (Breure & Backhuys, 2016). The exchange of material may have been documented if the receiving person kept a record (e.g., he kept the original labels or made a note when writing his own labels); the quality of this documentation varies largely between persons (and also between museums where collections may have ended up). The exchange of formal knowledge via reprints may only be traced in cases where the reprints are part of the preserved archive of a person or this person kept record to whom he sent his own reprints (e.g., Dautzenberg archive; Breure, 2015, 2016).

To explore the potential usefulness of eponyms as a proxy for contacts, an attempt has been made to reconstruct the egonets of five European malacologists: H. Crosse (1826–1898), P. Dautzenberg (1849–1935), H. Drouët (1829–1900), A. Morelet (1809–1892), and M. Schepman (1847–1929). For each of them their egonet is reconstructed on the basis of available archival correspondence data (Crosse), published studies involving partial correspondence data (Dautzenberg: Breure, 2015, 2016; Schepman: van der Bijl et al., 2010), respectively ongoing studies (Drouët: Audibert & Breure, in preparation; Morelet: Breure & Ablett, in preparation). Eponyms from c.q. for each author have been traced from literature. This paper is focussed on testing if persons to whom eponyms have been given were all direct contacts of an author. As reciprocation and exchange are fundamental human social processes involving positive emotions (Robins, 2015: 29), reciprocity of eponyms is considered an indication for inclusion in the ‘core contacts group’ of an author.

Material and methods

The following data sources have been analysed for this study: 1) the Dautzenberg archive (currently in the Royal Belgian Institute of Natural Sciences, Brussels; RBINS); 2) the Crosse archive (currently in the private possession of W. Backhuys, Kerkwerpe, the Netherlands); 3) the study about M. Schepman (van der Bijl et al., 2010; especially pp. 18–22, 28–29, 100–103); 4) ongoing research on the work of A. Morelet (Breure & Ablett, in preparation); 5) ongoing research on the work of H. Drouët (Audibert & Breure, in preparation). The nature of available data varies for each source. Some have a partial or complete overview of incoming letters (Crosse, Dautzenberg), while in other cases also a partial or complete overview exists of contacts via provenance data in the collection (Dautzenberg, Schepman); in one case (Morelet) data on contacts is available extracted from his papers and via provenance data from his dispersed collection, while finally in the case of Drouët contact data have been derived from his papers and a few of his surviving letters. Data on reprint exchanges are only available for Dautzenberg (Breure, 2016). The intensity of a contact is measured by the number of letters, in case a correspondence archive is present (but see below). For each person eponyms (uni- or bilateral, i.e. given by the author to others, or given by others to the author during his life time) have been extracted from their bibliography (either published or from online sources), new taxa list (if available), and from literature. Only obvious eponyms have been taken into consideration (e.g., no eponyms based on first names). Eponyms which have been given merely out of esteem (e.g., to a non-scientist) and posthumous eponyms have been excluded, unless a direct contact could be inferred from the other data. Reciprocated eponymy have been categorised as out-degree (an author gave an eponym) and in-degree (an author received an eponym). Networks were visualised using Gephi 0.9.1 with Fruchterman Reingold layout using standard settings and the name labels in the combined egonets varying in size according to their eigenvector centrality (measure of the importance of a node in a network) (Bonacich, 1972). The following network metrics are used: n , number of nodes; AD, average degree (the average number of connections with other nodes); ND, normalised network diameter (the longest graph distance between any two nodes in a network); M , modularity (measure of the number of communities detected in a network) (Newman, 2006). The latter three metrics were calculated with the statistics function in Gephi using standard settings. Other abbreviations: AM, malacological authors; AO, authors in other disciplines; CC, cabinet collectors; FC, field collectors; UN, unspecified relationship.

Results

Crosse

As managing director of the *Journal de Conchyliologie*, it may not be a surprise that his correspondence archive contained letters from 412 persons and institutions. In total Crosse dedicated 291 taxa to 145 persons. Of these persons, 47 were not represented in his correspondence archive; this includes field collectors from whom Crosse probably received material via one of his correspondents (see also below). In total there were thus 98 persons who received an eponym with whom Crosse has been in direct contact. From 27 persons he received 41 eponyms during his life time, of which 25 eponyms in reciprocity from in total 12 persons.

Dautzenberg

Also Dautzenberg seems to have had a very large egocentric social network. Breure (2015) mentioned a total of 464 persons, based on the collection of autograph letters in the Dautzenberg archive. The total number of contacts with whom he exchanged reprints (uni- or bilateral) was 492, partially overlapping the autograph listing. When removing institutions, a list of 481 persons remains (see Supplementary Information, under Dautzenberg), which Breure (2016) indicated as 'active contacts'. Dautzenberg gave in total 309 eponyms to 121 persons, which were all direct contacts (represented in at least one of the categories autograph, collection or reprint). He received

77 eponyms from 52 persons, two of which were not in his list of contacts. Persons with bilateral eponyms (reciprocation) were 25 and nearly completely overlap the group of 'high intensity' contacts in Breure (2016).

Drouët

The contact network of Drouët has been reconstructed from data in his papers and from provenance data in the parts of his collection recently re-located (Audibert, 2010, 2011); this list includes 115 persons. He described 31 taxa which he gave a person's name; in total 21 persons were dedicated in this way. There were only two persons with reciprocated eponyms.

Morelet

The contacts of A. Morelet have been derived mainly from his papers, and indirectly from provenance data of type material in different museums (Breure & Ablett, in preparation). Although this might be slightly underestimated, the current list has a total of 74 persons. Morelet has given 73 eponyms to 45 persons, and received 50 eponyms from 29 other persons during his life time. Only one outdegree eponym was likely given out of esteem (J. Bayol), and has been excluded. There were nine persons with bilateral eponyms.

Schepman

The list of correspondents of M. Schepman have been derived from the extensive study by van der Bijl et al. (2010: 18–22). Also considered as correspondents are the persons who assisted and/or gave support to Schepman in writing his publications (van der Bijl et al., 2010: 35). In total these are 51 persons, all located in Europe except three (Dall, Hedley and von Möllendorff). Persons related to the Schepman collection have also been taken from van der Bijl et al. (2010: 28–29), excluding institutions, and firms. According to A.N. van der Bijl (pers. commun. 6 Sept. 2016), Schepman also received material from the Leiden museum, and many persons listed by van der Bijl et al. (2010) as related to the Schepman collection were not directly linked to him. In total 49 persons remain where a direct link with Schepman may safely be assumed. According to van der Bijl et al. (2010: 100–101) Schepman named 70 new molluscan taxa after 39 persons (according to van der Bijl et al. (2010: 101) either collectors or persons who assisted him in his malacological research), while 7 persons gave him one or more eponyms during his life time; eponyms given after 1929 have been excluded (with one exception, see below). Eponyms given by Schepman to Rumphius (1628–1702) and Reeve (1814–1865) were posthumous and have been discounted. The eponyms given by E.J. Koperberg shortly after Schepman's death are, however, included as she is also among the persons related to his collection. Since these categories show some overlap (see Supplementary Information, under Schepman), the total number of contacts (correspondents + collection) is 100, and the total number of eponym contacts is 45. Several persons appear in our survey with an unspecified relationship (i.e. no correspondence or material in collection known); however, some persons nevertheless may be assumed to have been in direct contact with Schepman taken the contextual information into account (e.g., Büttikofer, Thiele; see van der Bijl et al., 2010: 100–101). There were two persons who gave eponyms in reciprocity.

Direct and indirect contacts

As mentioned above, the degree may vary to which persons who received an eponym from an author had direct contact (either face-to-face, or via correspondence or exchange of material) with that author. In the case of Crosse 47 persons were not represented in his correspondence archive. When we analyse the reason it is striking that most are field or cabinet collectors, and from some persons it becomes clear from the publication that their material came to Crosse's hands through a known third person (e.g., E. Marie supplied material collected in New Caledonia by several other

persons). However, it should be noted that also several persons were located in or near Paris, which may explain the lack of correspondence because the contact may have been face-to-face. In the cases of Dautzenberg, Drouët and Schepman all persons had a direct link to these authors; in the case of Morelet only one eponym was given out of esteem and it is unsure if there was a direct contact or not.

Eponym proportion and distribution among persons

The proportion of out-degree eponyms related to the total number of taxa described varies per author (Crosse: unknown, as there is no inventory of all his described taxa; Dautzenberg 16% (309/1895); Drouët 22% (31/142); Morelet 10% (73/741); Schepman 17% (70/420). Also the distribution of eponyms among the persons given varies but in most cases follows a similar pattern (Fig. 1).

Timing of first eponym

Although all eponyms are datable to their year of publication, their analysis is restricted to the case of Crosse as this allows the most precise comparison with the moment in time the relationship was supposedly established between the author (i.e. Crosse) and the person to whom an eponym was given for the first time. After removing all cases with insufficient data, 90 eponyms remained of which their time of publication varied between 25 years before to nine years after the first contact may have been laid as far as the correspondence archive shows (see also discussion). The average is 0.01, and the frequency follows largely a normal distribution (Fig. 2).

Visualisation of networks

The networks of persons may be depicted at three levels: a) their (presumably) total contacts; b) the persons related to their in-degree and out-degree eponyms ('eponym contacts'); c) the subset of the eponym contacts consisting of persons who are authors (either in malacology or in other disciplines) themselves. In Figs 3–5 this is illustrated in the case of Drouët; we see that the network metrics vary not or only slightly with the three levels, except the number of nodes. Also when we combine the egonets of contemporary authors (Crosse, Drouët, and Morelet) the resulting metrics are very similar (Figs 6–7).

Discussion

The statistician Stigler (1980) stated that no scientific discovery is named after its original discoverer ("Stigler's law of eponymy"). The use of eponyms in taxonomy seems to follow Stigler's law of eponymy if the description of a new taxon is considered a 'scientific discovery'. However, this may be due to a greater extent to the ethical rule among taxonomists not to name a new species to him- or herself (see for exceptions e.g., *Unio heudei* 'Bazin ms.' Heude, 1874 (Heude, 1874: 114), and *Helix anceyi* 'von Möllendorff ms.' Ancey, 1889, *Ennea anceyi* 'Neville ms.' Ancey, 1890, *Spatha anceyi* 'Bourguignat in litt.' Ancey, 1894 (cf. Wood & Gallichan, 2008: 23)). Since the cases under study largely cover the second half of the 19th century, it is useful to look for the historical cultural context in which eponymy was applied. Common ways for giving an eponym were to reward someone who had collected material for the author (frequently observed in most cases studied), or to give esteem to a respectable colleague (most obvious if the person was already deceased at the time of publication). Eponyms might also have served as a means to build trust in a new relationship or as medium for exchange of material. During the period of the 'Nouvelle École', Bourguignat once wrote (to an unknown) malacologist: "Vos anodontes [shells], qui portent votre

nom [because Bourguignat had given the eponym], me sont arrivés”, thus strongly suggesting Bourguignat may have used (part of) his out-degree eponyms to receive material from the dedicated person (original letter in personal archive of C. Audibert). Some persons, however, having sent him material, refused the dedication of an eponym after all (cf. Coutagne, 1895: 119). But this same Bourguignat was not afraid to use eponyms to outrage a colleague. His description of *Unio meretricis* [whore] in Locard (1882: 295, 363) was followed by Bourguignat in Baichère (1890: 121) with the addition “Comme on le sait, l'*Unio meretricis*, dont la présence a été constatée en France par M. Locard dans un grand nombre de localités, a son type dans l'Arno, à Florence et à Pise” [referring to the places where malacologist countess Paulucci lived]. Eponyms can thus be used for naming and shaming, but examples of such shameless use of the latter are luckily scarce.

One of the items in this study was the timing of the first eponym, as the data from the Crosse archive allow for an ‘approximate’ start of the relationship between Crosse and his correspondents. Approximate is here used between quotation marks, as some of the data suggested completeness while the date of the first eponym suggests an earlier contact. It is possible that an eponym was published shortly before the first archived letter of the respondent arrived if it is assumed that the initiative for the relationship was taken by Crosse. For that reason a margin of one year could be taken between the date of the letter and the year of publication. In cases where the difference is larger, it might be partially explained in cases where the respondent lived in or in the proximity of Paris, assuming that contacts were normally in person. As the results (Fig. 2) show a distribution which largely centres around zero, both hypotheses formulated above (eponyms as a means to build trust in a new relationship or as medium for exchange) are still possible. While there was a case for the latter with the Bourguignat letter, there was also a case for the former hypothesis when Crosse was approached by Hidalgo (Breure & Backhuys, 2016). Essentially this has to be judged on a case-by-case basis, but in most cases the historical material in archives does not allow a readily conclusion.

The proportion of eponyms seems to reflect largely a personal preference by the authors. Most authors have awarded collectors of material, who supplied the specimens for study and description, usually quite liberally with eponyms. But e.g. Drouët, although relatively liberally, has been quite reticent with eponyms per persons, reserving multiple eponyms only for his best contacts. The reciprocation of eponyms shows no constant pattern, although in most cases the number of in-degree eponyms are lower than the out-degree numbers. When taking an overall look, it is clear that all eponyms lead to contacts of the author, either directly (via face-to-face or via correspondence; in most cases) or in a few cases indirectly (via a two-step link). In principle eponyms may thus serve as a proxy for contacts of an author.

Since complete historical archives for authors are scarce, this opens the way to further explore the social networks of malacologist by carefully analysing their eponyms, taking into account the contextual data. For future research in this direction a whole array of theories and methods is available in the ‘digital humanities’. Especially the application of social network analysis looks promising to unravel links between malacologists in the past. It would be interesting to see how the ratio of amateurs vs. professionals in malacology developed over time in analogy to the case study on Dautzenberg (Breure, 2016). By applying the method of social network analysis, it might be possible to obtain a better understanding of the development of this discipline during the 19th and early 20th centuries, while in some cases the provenance of (type) material in museum collections may be better explainable. This could be useful evidence in studies on type material in museum collections.

Conclusion

Authors have had personal preferences in the extent to which they dedicated eponyms to persons they were in contact, either indirectly (field collectors) or directly (field collectors, cabinet collectors or collegial authors). Eponyms named after a person who is known to have authored malacological papers strongly suggests that there was contact between the two authors (correspondence and/or exchange of material). If eponyms were given in reciprocation their contacts were likely to be relatively strong. Contextual data (e.g., as given in the original publications) and biographical data has to be taken into account during the interpretation to assure the quality of the dataset. Papers that present lists of new taxa described by an author should also pay attention to the contact network that lies behind. Application of methodologies from the social sciences (e.g., social network analysis) may further the insights in the history of malacology.

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Supplementary file

A supplementary file with data on the eponym contacts of the authors mentioned is available at doi: 10.6084/m9.figshare.4223538.

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Legends

Figure 1 **Distribution of eponyms.** The number of eponyms is plotted for four selected persons, divided in out-degree (blue) and in-degree (green).

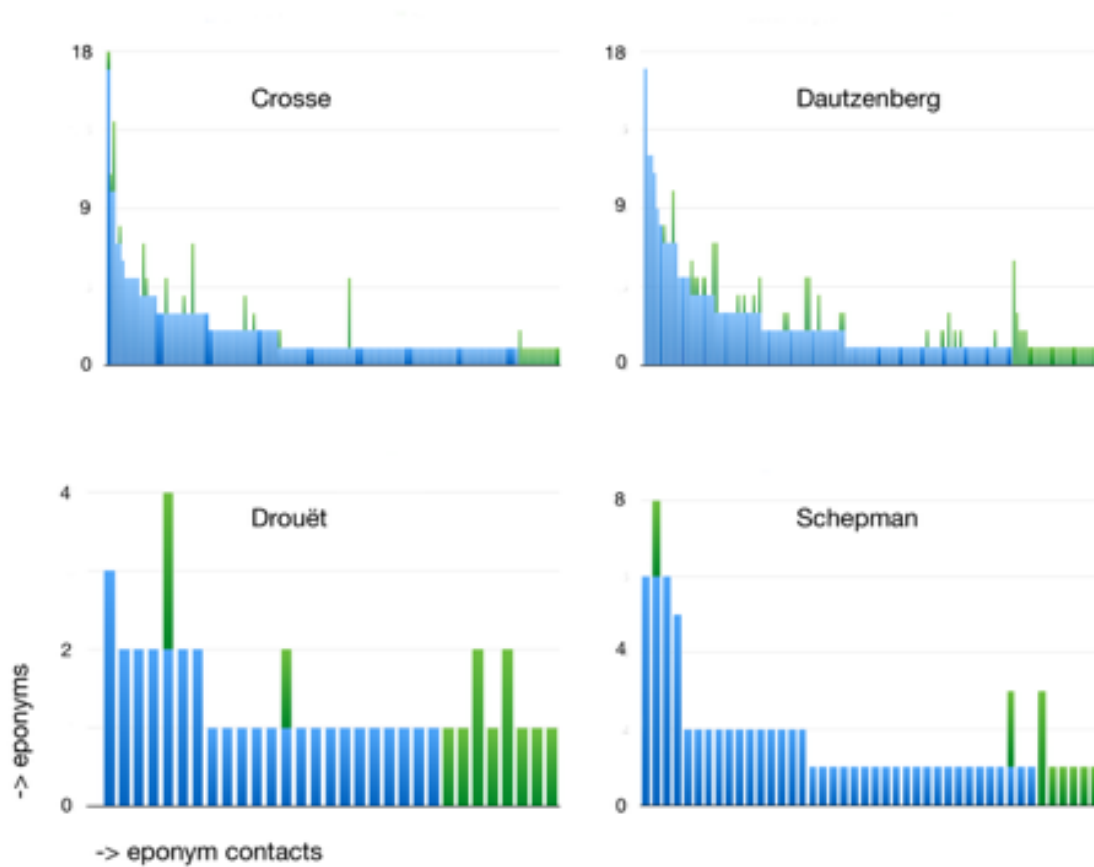


Figure 2 **Timing of first out-degree eponym.** The difference between the year of the first out-degree eponym given by Crosse and the supposed start of the relationship as evidenced by correspondence. The solid curve line is the normal distribution.

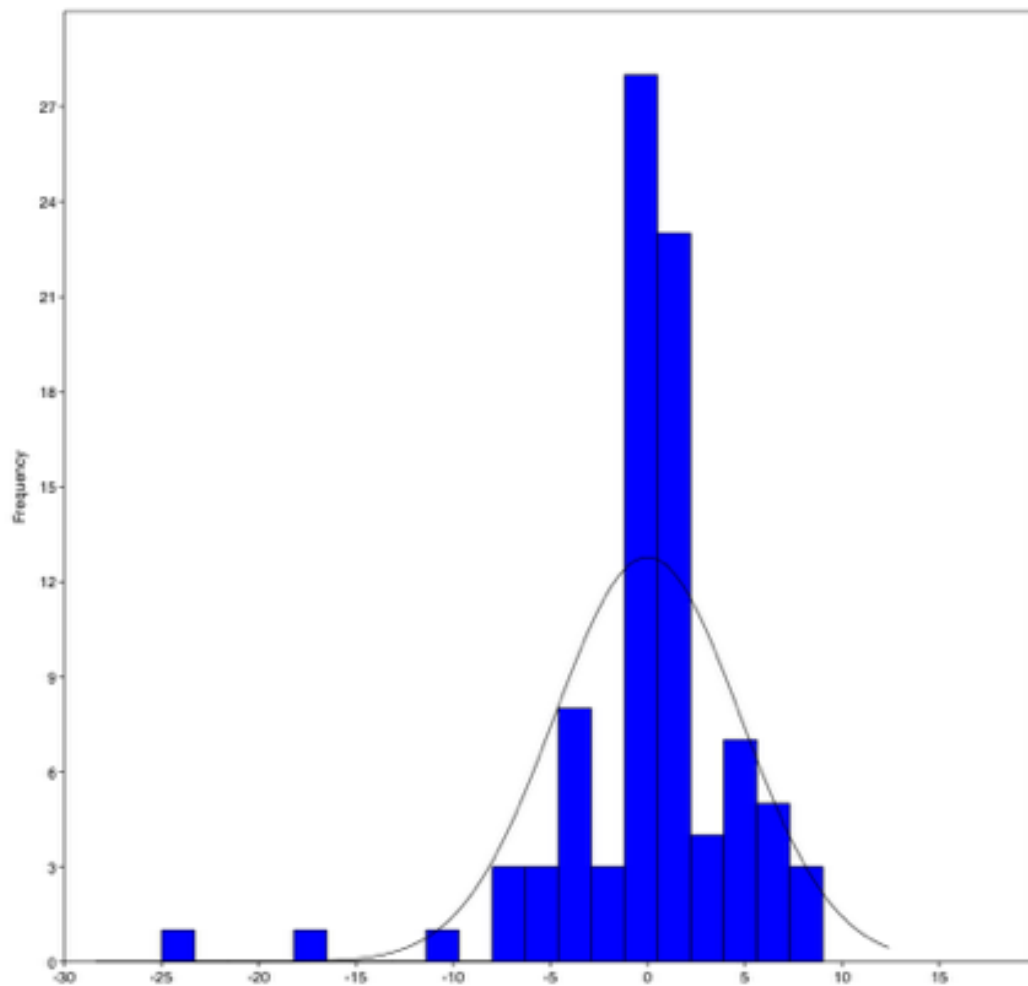


Figure 3 Total contacts network of Drouët. See text for abbreviations.

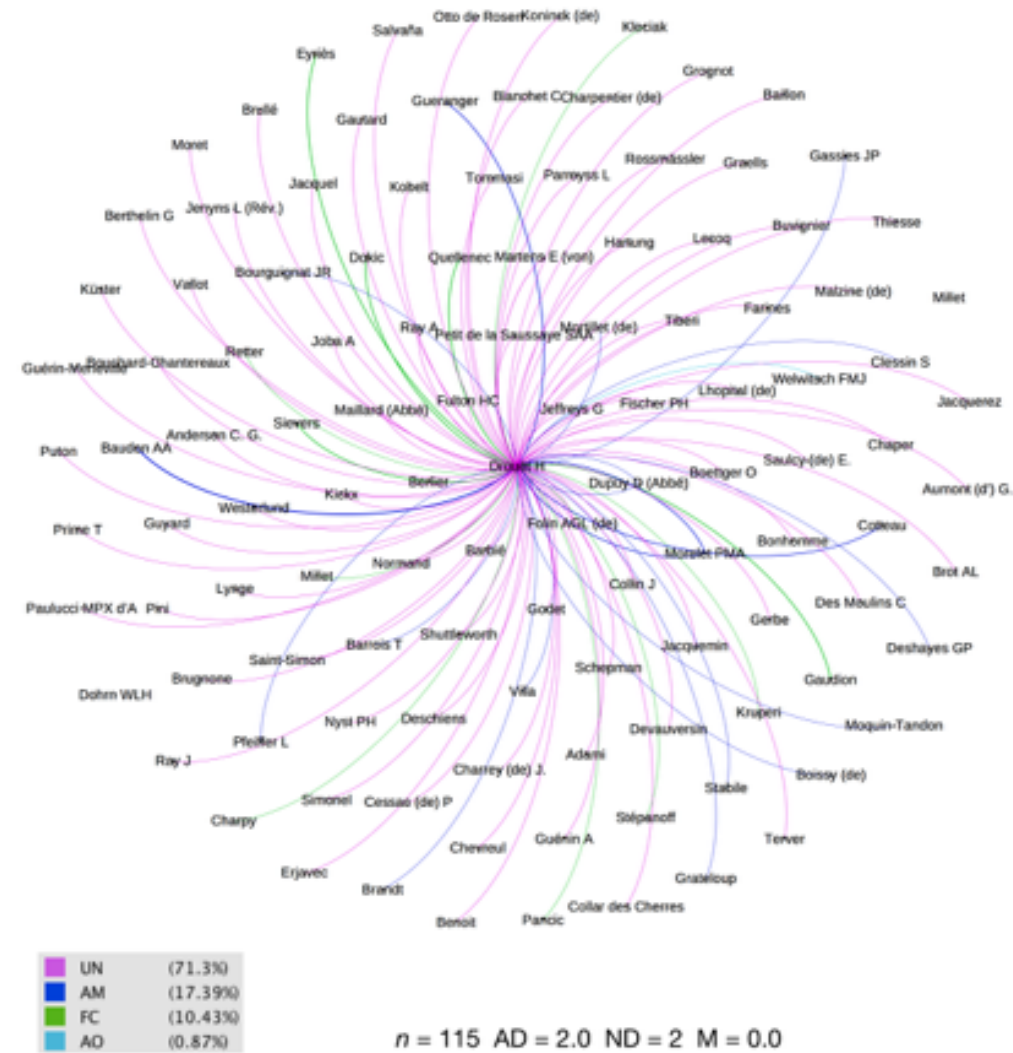


Figure 5 Eponym authors network of Drouët. See text for abbreviations.

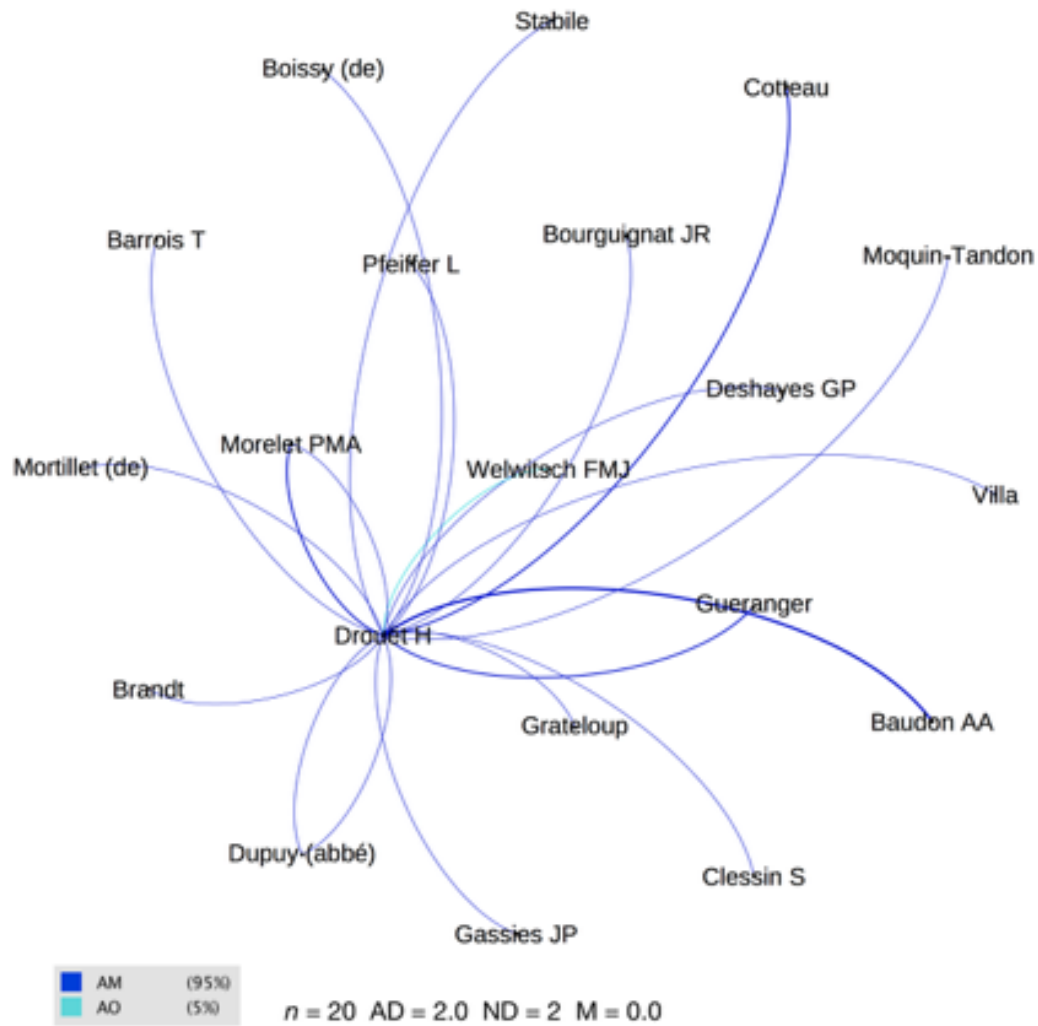


Figure 6 Combined eponym contacts network of Crosse, Drouët, and Morelet. See text for abbreviations.

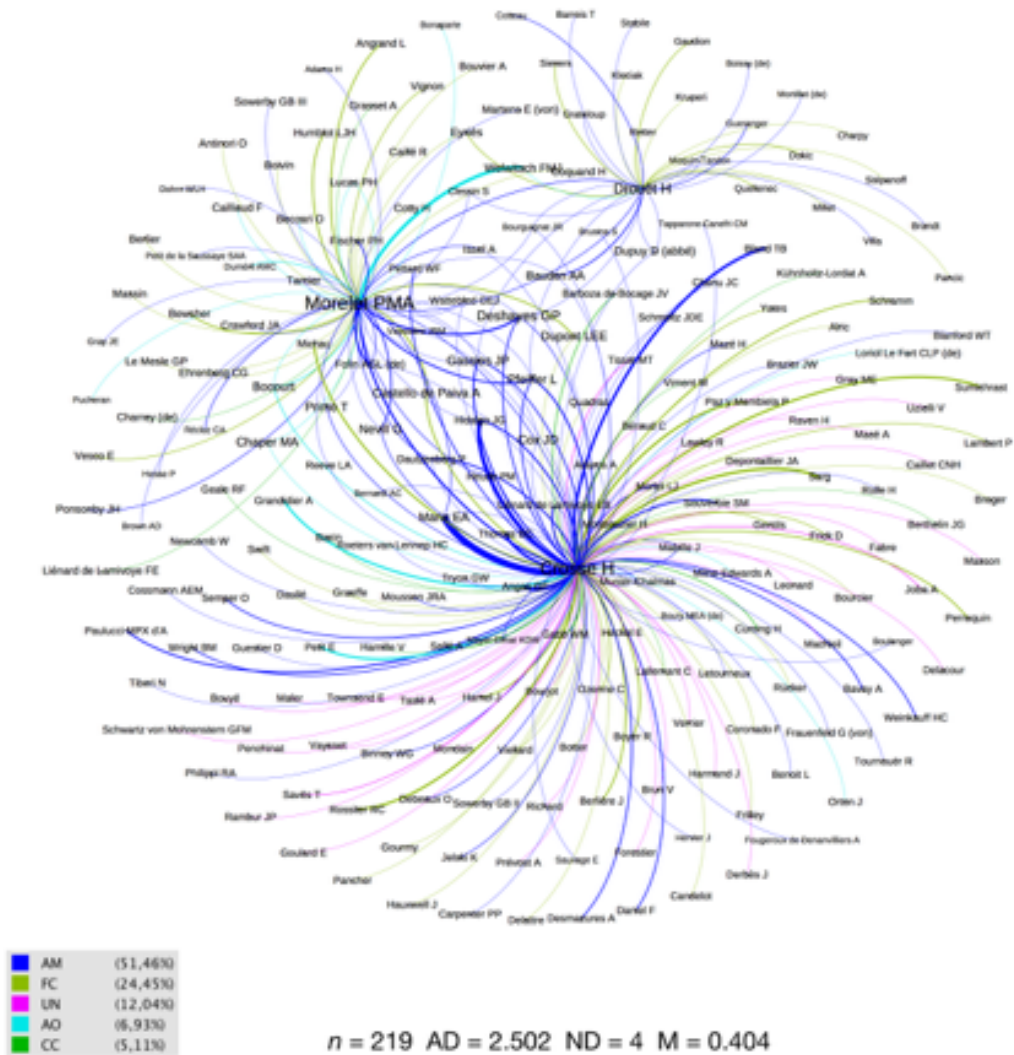


Figure 7 Combined eponym authors network of Crosse, Drouët, and Morelet. See text for abbreviations.

