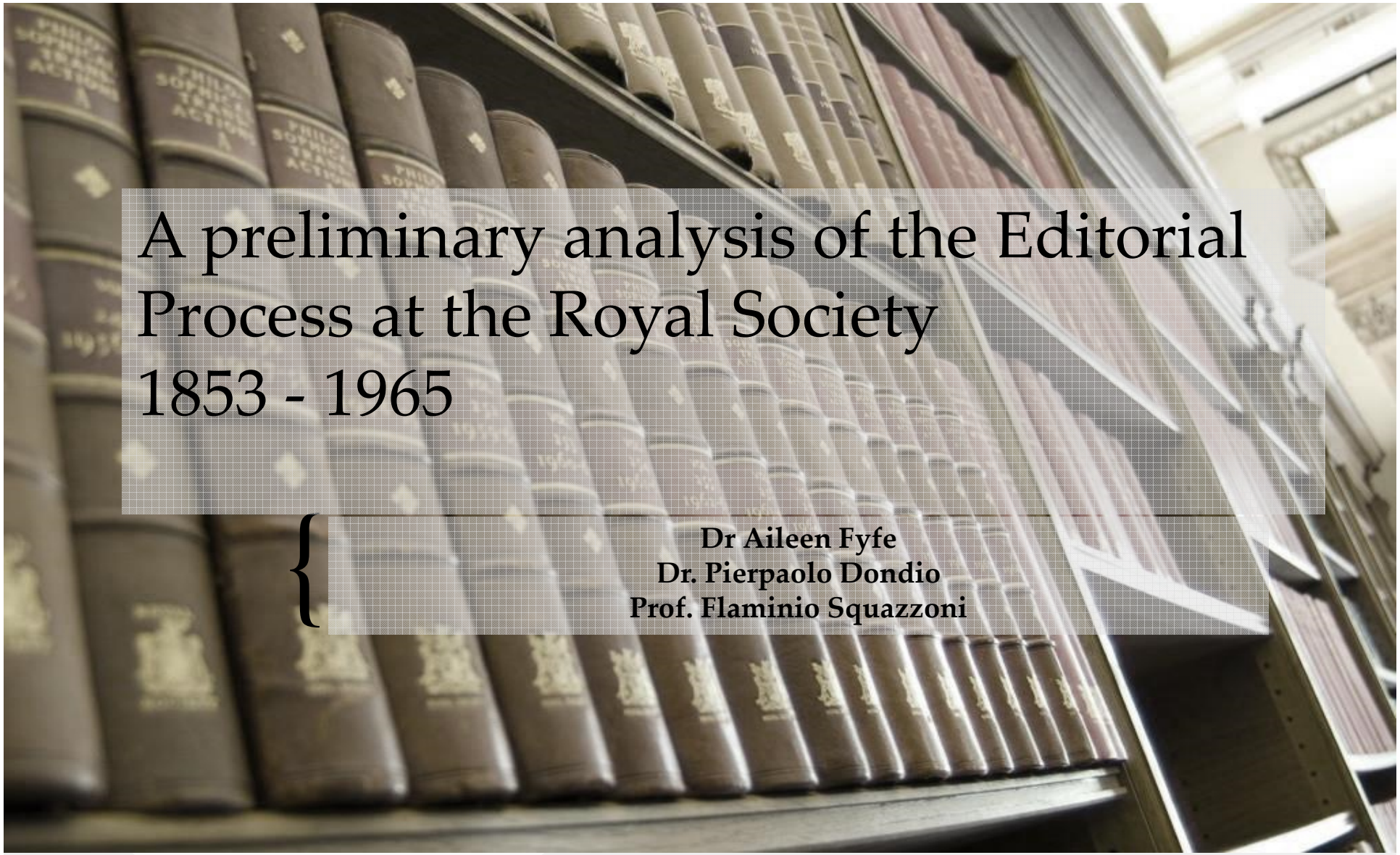


A preliminary analysis of the Editorial Process at the Royal Society 1853 - 1965

Dr Aileen Fyfe
Dr. Pierpaolo Dondio
Prof. Flaminio Squazzoni

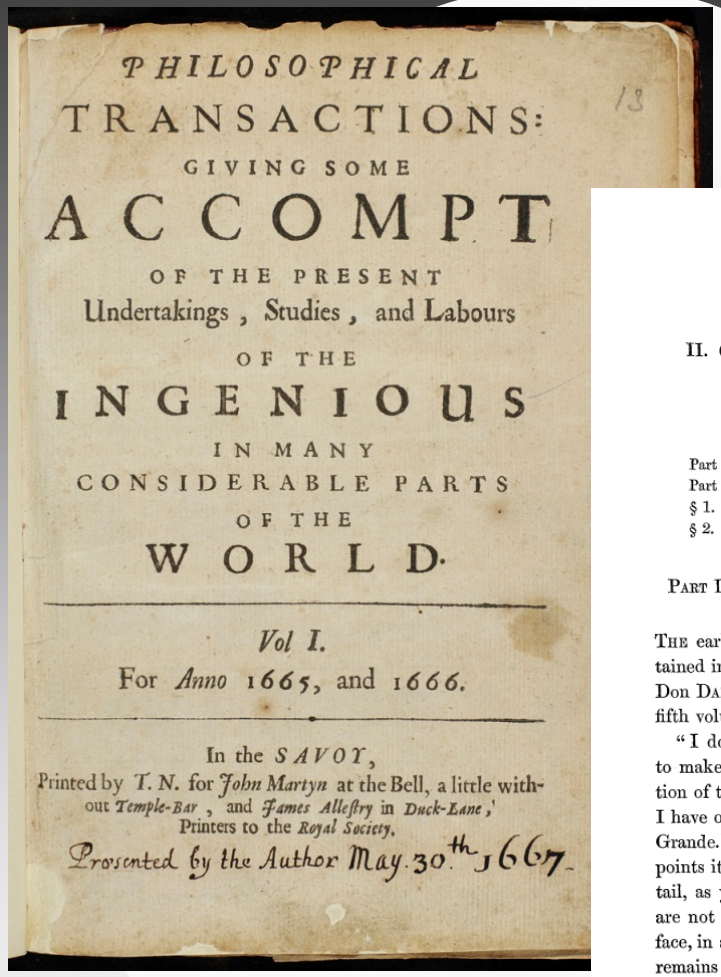
Arts & Humanities Research Council

THE ROYAL SOCIETY

University of St Andrews

https://arts.st-andrews.ac.uk/philosophicaltransactions/

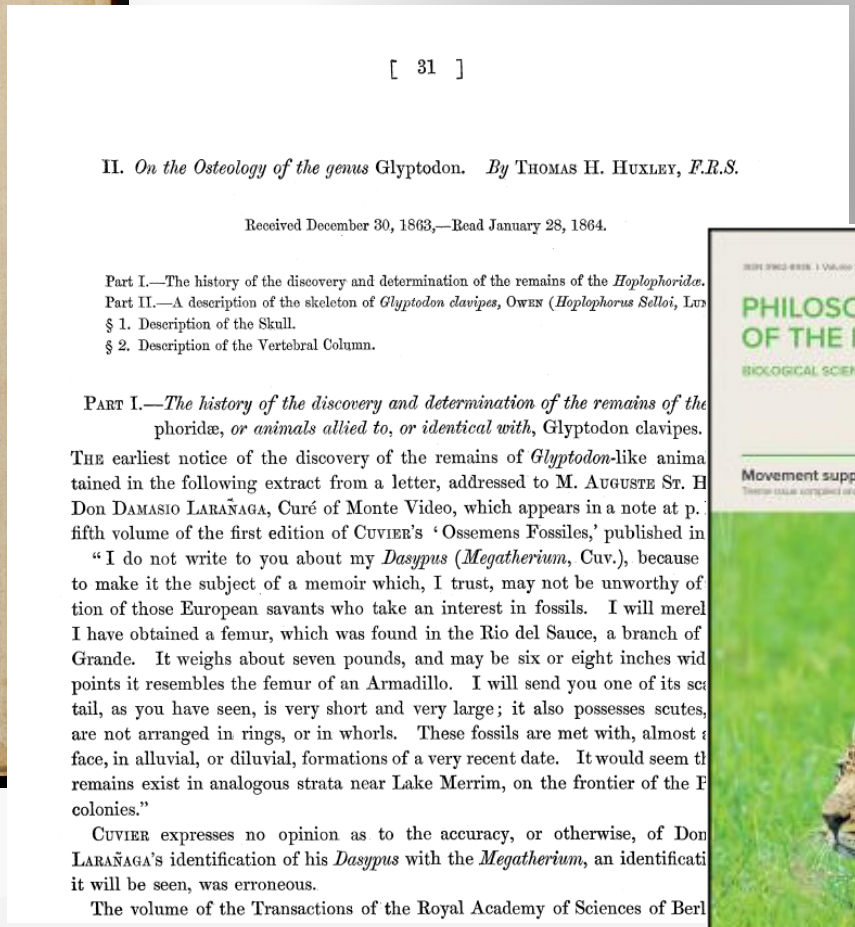
The *Philosophical Transactions*



PHILOSOPHICAL
TRANSACTIONS:
GIVING SOME
ACCOMPT
OF THE PRESENT
Undertakings, Studies, and Labours
OF THE
INGENIOUS
IN MANY
CONSIDERABLE PARTS
OF THE
WORLD.

Vol I.
For *Anno* 1665, and 1666.

In the *SAVOY*,
Printed by *T. N.* for *John Martyn* at the Bell, a little without *Temple-Bar*, and *James Allestry* in *Duck-Lane*,
Printers to the *Royal Society*.
Presented by the Author May. 30th 1667.



[31]

II. *On the Osteology of the genus* Glyptodon. *By* Thomas H. Huxley, *F.R.S.*

Received December 30, 1863,—Read January 28, 1864.

Part I.—The history of the discovery and determination of the remains of the *Hoplophoridæ*.
Part II.—A description of the skeleton of *Glyptodon clavipes*, Owen (*Hoplophorus Selloi*, Lu
§ 1. Description of the Skull.
§ 2. Description of the Vertebral Column.

Part I.—*The history of the discovery and determination of the remains of the* phoridæ, *or animals allied to, or identical with*, Glyptodon clavipes.

The earliest notice of the discovery of the remains of *Glyptodon*-like anima tained in the following extract from a letter, addressed to M. Auguste St. H Don Damasio Larañaga, Curé of Monte Video, which appears in a note at p. fifth volume of the first edition of Cuvier's 'Ossemens Fossiles,' published in

"I do not write to you about my *Dasypus* (*Megatherium*, Cuv.), because to make it the subject of a memoir which, I trust, may not be unworthy of tion of those European savants who take an interest in fossils. I will merel I have obtained a femur, which was found in the Rio del Sauce, a branch of Grande. It weighs about seven pounds, and may be six or eight inches wid points it resembles the femur of an Armadillo. I will send you one of its sc tail, as you have seen, is very short and very large; it also possesses scutes, are not arranged in rings, or in whorls. These fossils are met with, almost face, in alluvial, or diluvial, formations of a very recent date. It would seem t remains exist in analogous strata near Lake Merrim, on the frontier of the colonies."

Cuvier expresses no opinion as to the accuracy, or otherwise, of Don Larañaga's identification of his *Dasypus* with the *Megatherium*, an identificati it will be seen, was erroneous.

The volume of the Transactions of the Royal Academy of Sciences of Berl

Philosophical Transactions, 1665; 1865; 2017

Title	Author	Communicated by	Received	Read	Referees	Voted on	
First Analysis of 177 Magnetic Storms, registered by the Magnetic Instruments in the Royal Observatory Greenwich, from 1841 to 1857.	G. B. Airy		Oct. 28	Dec. 17	1863 Dec. 2 Mr A. Smith × " 18 Sir J. Herschel ×	1864 Jan 28	Phil Trans. Printer Jan. 30
On the Meteorological Results shown by the Self-registering Instruments at Greenwich during the extraordinary Storm of Oct 30. 1863	J. Glaisher		Nov. 23	Nov. 26		1863 Dec. 17	Proceedings
On the sudden Squalls of the 30th October and 21st November 1863	B. Stewart		Dec. 10	Dec. 17		Dec. 17	Proceedings
Extract of a Letter to General Sabine from Dr Otto Torell. dated Copenhagen Dec. 12. 1863	Dr Otto Torell	Gen. Sabine	Dec. 18	1864 Jan. 7	1864	1864 Jan. 28	Proceedings
Examination of Rubia munjista, the East Indian Madder, or Munjeet of Commerce	Dr Stenhouse		Dec. 21	Jan. 14	Jan 16 Mr Schunck × " 22 Dr Miller ×	Jan. 28	Proceedings Author Jan 30
Ueber die in Greenwich beobachteten magnetischen Variationen	Prof. Wolf	Mr Airy	Dec. 21	Jan. 14		Jan. 28	Proceedings
Results of hourly Observations of the Magnetic Declination made by Sir F.L. M'Clintock & the Officers of the Yacht Fox at Port Kennedy in the Arctic Sea. 1858-1859; & a Comparison of these Results with those obtained by Capt. Maguire & the Officers of H.M.S. Plover in 1852-54 at Point Barrow	General Sabine		Dec. 21	Jan. 7	Jan. 12 Mr A. Smith × Jan 21 Rev. Dr Robinson ×	Jan. 28	Phil. Trans. Printer Feb. 5
On the Osteology of the Genus Glyptodon Pt. I & II	J. H. Hurley		Dec 30	Jan. 28	Feb. 19 Dr Falconer × May 5 Mr Busk ×	June 23	Phil. Trans.
On the Conditions, Extent & Realization of a Perfect Musical Scale on Instruments with fixed Tones	A. J. Ellis	C. Wheatstone	1864 Jan. 7	Jan. 21		Jan. 28	Proceedings Printer Jan. 22
On a Comparison of certain Traces produced simultaneously by the Self-recording Magnetographs at Kew & at Lisbon, especially of those which record the magnetic disturbance of July 15. 1863	Senhor Capello and B. Stewart		Jan. 14	Jan. 28		Feb. 18	Proceedings

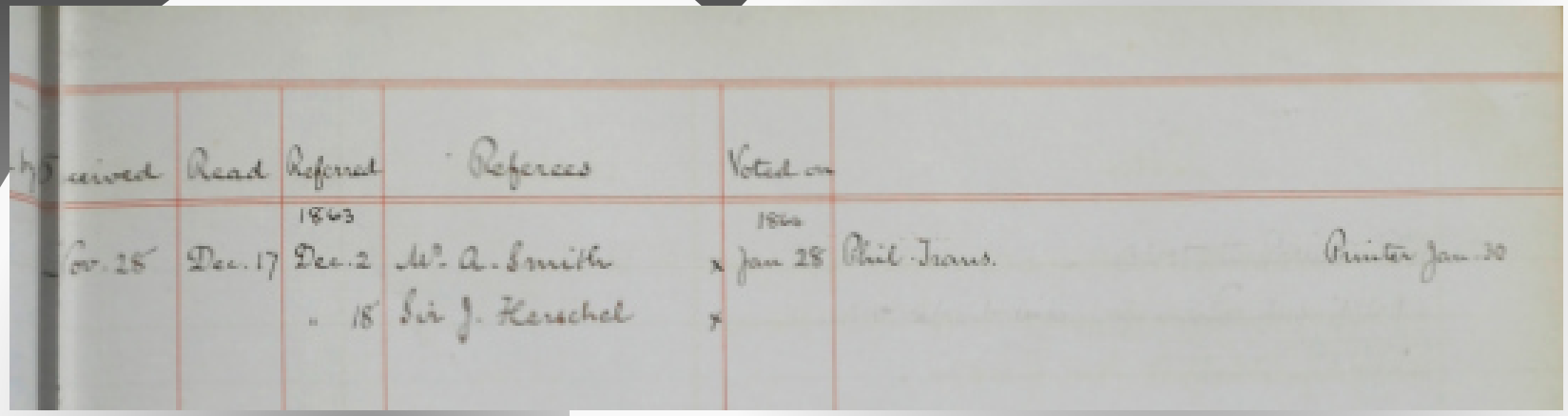
No.	TITLE.	Author.	Communicator.	Received.	Read.	Referred.	Referees.	M. S. Returned by Referees.	Reported to Sectional Committee.	Vote of Council.	Destination.
169	On the Isolation of the Infecting Organism ("Zoochlorella") of Convoluta roscoffensis.	Frederick Keeble, University College, Reading. F. W. Gamble.	Prof. S. J. Hickson	Oct. 6th	Nov. 16.				Z May 9th 1906	May 17	Proceedings B LXXVII p. 66.
170.	On the Effects of Alkalies & Acids, and of Alkaline and Acid salts, upon growth and cell division in the fertilized eggs of Echinus esculentus. A study in relationship to the causation of malignant disease.	Prof. B. Moore, Bio-chemical Dept. University of Liverpool, Dr. H. E. Roaf, and Edward Whitley.	Prof. W. A. Herdman	Oct. 9th	Nov. 23				P Dec. 8.	—	Proceedings B LXXVII p. 102
171.	On the Laws of Radiation	J. H. Jeans, M.A.	Prof. J. Larmor, Sec. R.S.	October 11	Nov. 16.				P.C. Nov. 9.	Dec 7.	Proceedings A LXXVI p. 545.
172.	The Accurate Measurement of Ionic Velocities	Dr. R. B. Denison & Dr. B. D. Steele	Sir Wm. Ramsay	October 14.	Nov. 16.	Oct 24 Nov 1.	W. C. D. Whetham Sir O. Lodge.	Oct 31 Nov. 8.	P.C. Nov. 9.	Dec. 7.	Phil. Trans A. CCV p. 449.
173	Total Eclipse of the Sun, 1905, Aug. 30. Preliminary account of the observations made at Sfax, Tunisia	Sir William Christie K.C.B.		October 16	Oct. 19.	Oct 30	Sir W. Huggins	Nov. 2.	P.C. Nov. 9.	Dec. 7.	Proceedings A. LXXVII p. 28.
174.	Further work on the development of the Hepatomonas of Kala-Azar and Cachexial Fever from Leishman-Donovan Bodies.	Dr. Leonard Rogers, I.M.S.	Sir Michael Foster K.C.B., F.R.S.	October 16	Dec 14.				P Dec. 8.	—	Proceedings B LXXVII p. 284
175.	Report on the Psychology & Sociology of the Todas and other Indian Tribes: an abstract of work carried out by the aid of the Gunning Fund of the Royal Society for the year 1901-2	Dr. W. H. R. Rivers,	The Secretaries R.S.	October 18. 1905	Dec. 14				P Dec. 8.	—	Proceedings B. LXXVII p. 239.
176.	On certain Physical & Chemical Properties of solutions of chloroform and other anaesthetics. A contribution to the chemistry of anaesthesia. (Second communication)	Prof. Benjamin Moore, & Dr. H. E. Roaf	Prof. C. S. Sherrington	October 19. 1905.	Nov. 23				P Dec. 8.	—	Proceedings. B. LXXVII. p. 86
177.	Preliminary Report of the Expedition to Aswan to observe the Total Solar Eclipse of August 30, 1905.	Prof. H. H. Turner, F.R.S.		October 19	Oct. 19.	Oct 30	Sir W. Huggins	Nov. 2.	P.C. Nov. 9.	Dec 7.	Proceedings A. LXXVII p. 77.
178	Total Eclipse of the sun, August 30, 1905. Report of the Expedition to Castellón de la Plana, Spain.	Professor H. L. Callendar & Professor A. Fowler.		October 19	Oct. 19	Oct 30	Sir W. Huggins	Nov. 2.	P.C. Nov. 9.	Dec. 7.	Proceedings A LXXVII p. 1.

H & S 1922/51

1952.

No.	TITLE.	Author.	Communicator.	Received.	Read.	Referred.	Referees.	M.S. Returned by Referees.	Reported to Sectional Committee.	Vote of Council.	Passed for Publication.	Published.
22	Dielectric dispersion in pure polar liquids at very high radio frequencies. II. Relation of experimental results to theory.	J. A. Saxton	E.C. Bullard	7 Feb. '52.		12 Feb.	H. Frohlich, F.R.S.	20 Feb 52	P 19 May 52	3 Apl 52	21 Feb. '52.	Proc A. 1115
23	Diffusion and chemical reaction velocity in cylindrical and spherical systems of physiological interest (~~with an appendix on spherical systems~~)	F. J. W. Roughton. F.R.S		7 Feb. '52.		19 Feb: 19 Feb: 21 Mar: 52	A.V. Hill, F.R.S. Sir Eric Rideal, F.R.S. Sir John Lennard-Jones	26 Feb: 52 28 Feb: 52 17 Apl: 52	P 10 Apr 52	16 Oct 52	18 June	Proc B 899
24	The theory of regular solutions	J. S. Rowlinson	M. G. Evans.	12 Feb. '52.		18 Feb: '52 6 Mar: '52 28 Feb: 52	W. E. Garner, F.R.S. Sir J. Lennard-Jones, F.R.S. R. P. Bell, F.R.S.	no ref 26 Feb: 52 16 Apl: 52 5 Mar: 52	C 2 July 52	17 July 52	28 May	Proc A 111 7
25	A theoretical treatment of cation exchangers. I. The prediction of equilibrium constants from osmotic data.	~~J. F. Duncan~~ E. Glueckauf	M. G. Evans	12 Feb. '52.		21 Feb. 52	W.E. Garner. F.R.S.	10 Mar. '52	C 28 May 52	12 June 52	11 Mar 52	Proc A 111 7
26	Theory of ion exchange II. Equilibria between an ion exchanger and an aqueous solution with a common cation	J. F. Duncan ~~E. Glueckauf~~	M. G. Evans	12 Feb. '52.		25 Feb. '52	W.E. Garner, F.R.S.	8 Mar '52	C 28 May 52	12 June 52	11 Mar 52.	A 1118
27	Comparison of the acceleration due to gravity at the National Physical Laboratory, Teddington, the Bureau International des poids et mesures, Sèvres, the Physikalisch-Technische Bundesanstalt, Brunswick, and the Geodetic Institute Potsdam.	A.H. Cook.	E.C. Bullard, F.R.S.	13 Feb: '52		19 Feb:	R. Stoneley, F.R.S.	23 Feb: 52	P 19 May 52	3 Apl 52	5 Mar 52	Proc A 1114
28	The influence of pressure on the equilibrium between carbon dioxide and air.	T. J. Webster	E. Griffiths F.R.S.	18 Feb: '52		25 Feb.	Sir C. Hinshelwood, For. Sec. R.S.	28 Feb: '52	C 23 Apl 52	8 May 52	13 Mar 52.	Proc A 1116
29	On ~~fatigue theories and the~~ the statistical interpretation of fatigue tests. Part I	A.M. Freudenthal E.J. Gumbel.	H.J. Gough, F.R.S.	16 Feb. '52		21 Feb: 3 July 25 Feb:	E.A. da C. Andrade, F.R.S. A.C. Aitken R.H. Bailey	Nonp. 25 Feb. 52 11 Aug 52 26 Mar. '52	E 22 Oct 52	6 Nov 52.	26 Sept 52	Proc A 1126
30	The electrical resistance in a metal with plane of cleavage	K. Sarginson	N. F. Mott, F.R.S.	19 Feb: 52		19 June 17 June 23 Feb. 52	F. Yates Sir R. Fisher Sir L. Bragg F.R.S.	Nonp. 17 June 23 Mar 6 Mar: 52	—	—	—	withdrawn 6.3.52

What the data currently look like…



ceived	Read	Referred	Referees	Voted on	
		1863		1864	
Nov. 25	Dec. 17	Dec. 2	Mr. A. Smith	Jan 28	Phil. Trans. Printer Jan. 30
		" 18	Sir J. Herschel		

Received.	Read.	Referred.	Referees.	M.S. Returned by Referees.	Reported to Sectional Committee.	Vote of Council.	Passed for Publication.	Published.
7 Feb: '52.		12 Feb:	H. Frohlich, F.R.S.	20 Feb 52	P 19 May 52	3 Jul 52	21 Feb: '52.	Proc A. 1115

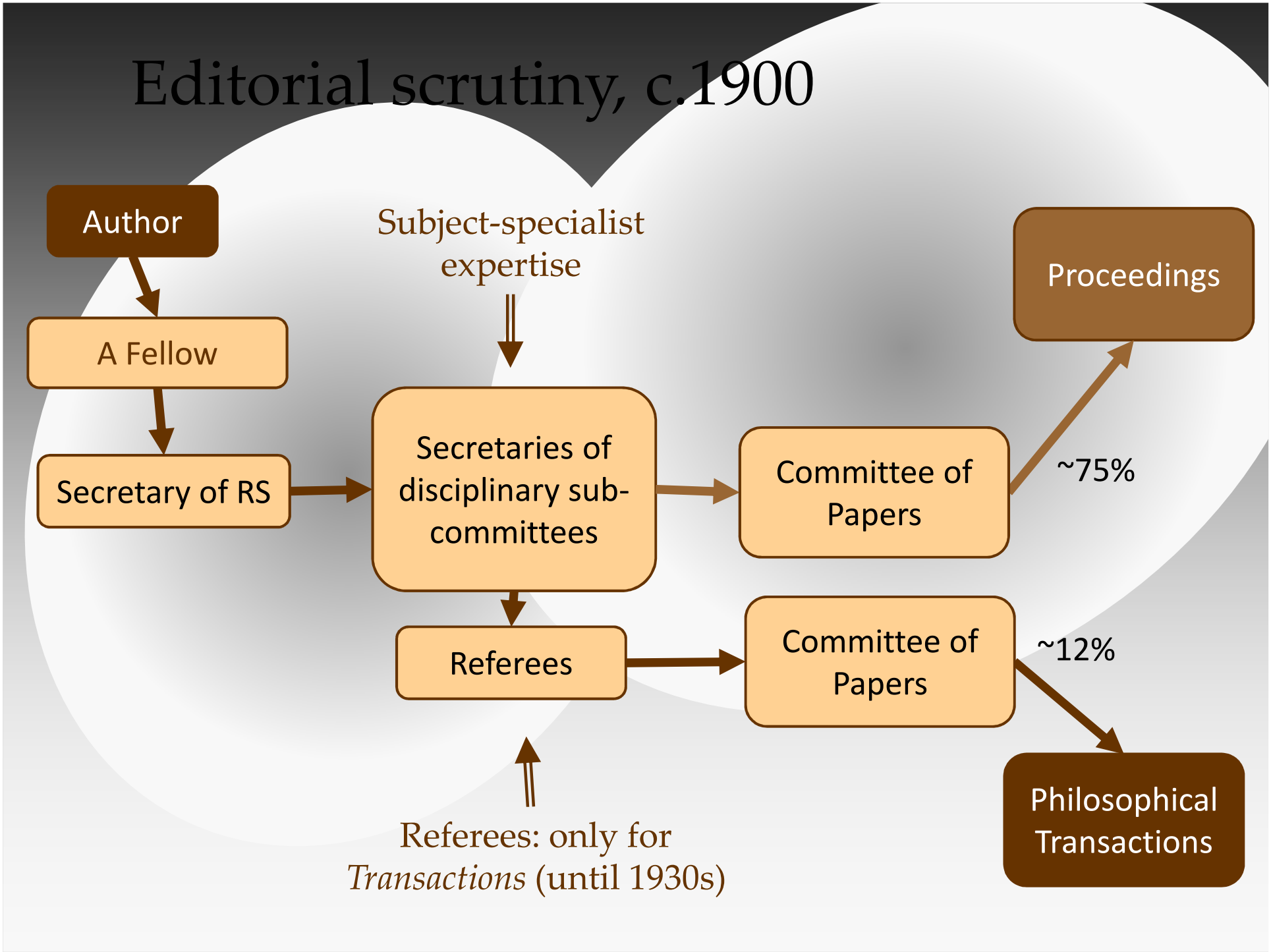
Ledger formats change slightly over time
Handwriting changes over time
In late 20thC, we have privacy issues…

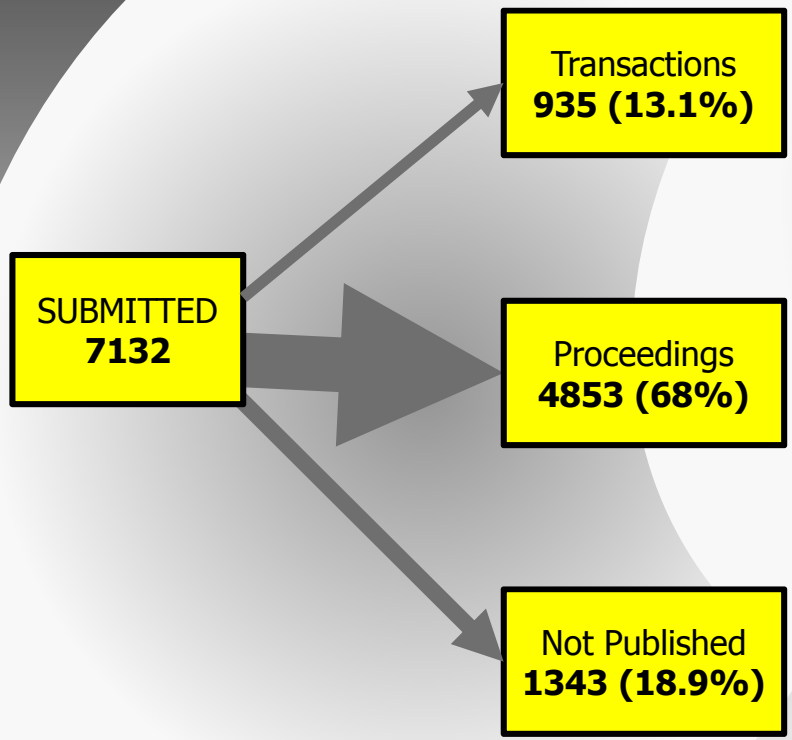
Available Data

- Paper information
  - Title, Authors, year, publication details (volume,page,..), communicators
- Author (if RS fellow)
  - Date of birth, dead, election
  - Member or Foreign member
  - Nationality (integrated from RS Website + Wikipedia)
  - Research Field (integrated) from RS Website + Wikipedia)
  - Gender
- Author (if not RS fellow)
  - Harder to identify
  - Some of them have a VIAF code
  - Some of them have only initials of names
  - Gender
- Editorial and Referee process
  - Referees – papers assignment
  - Editorial decision
  - (very few) referee decision
  - Time (when the paper was received, sent to review, sent back…)

- Long process of acquisition, cleaning and matching of data

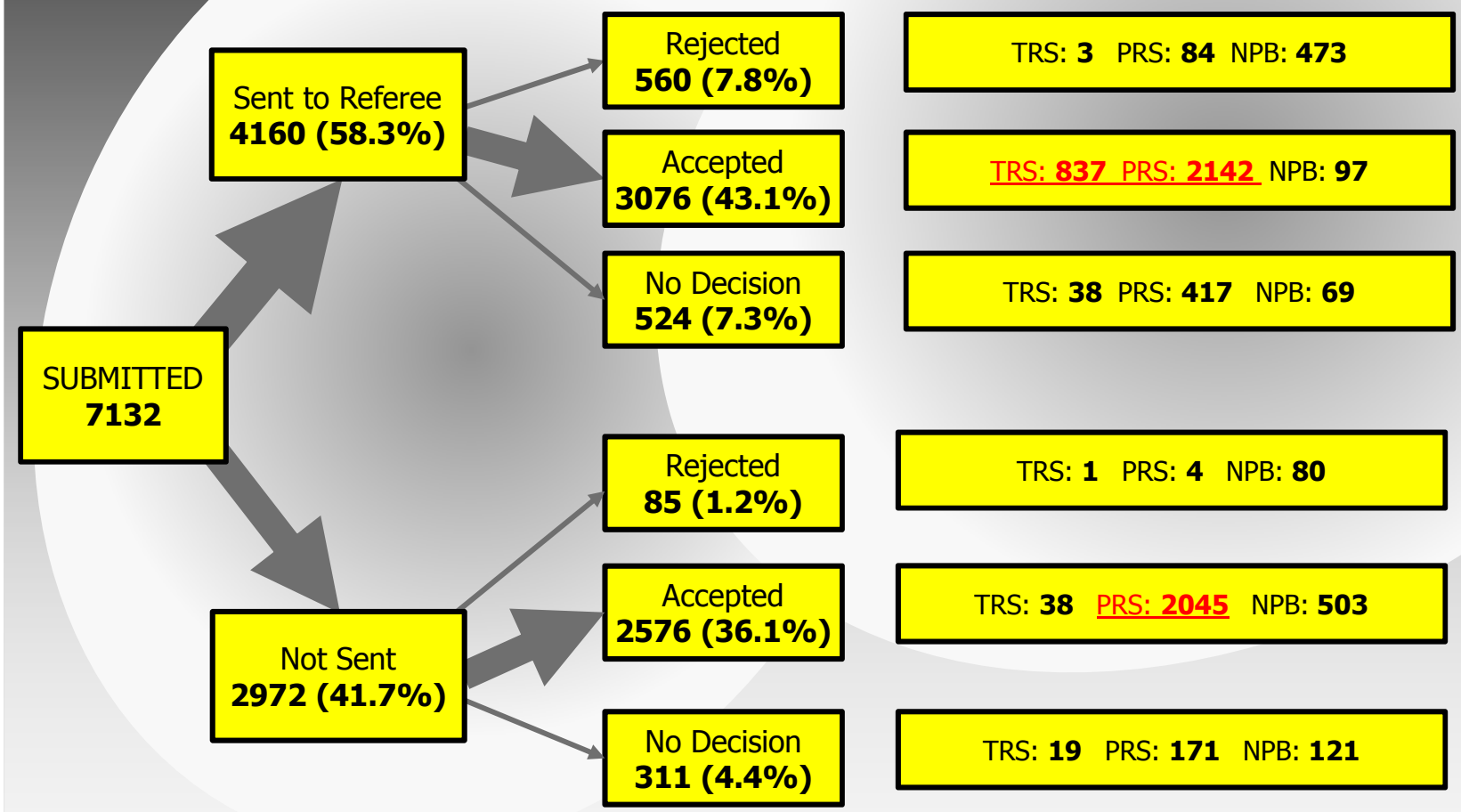
Editorial scrutiny, c.1900





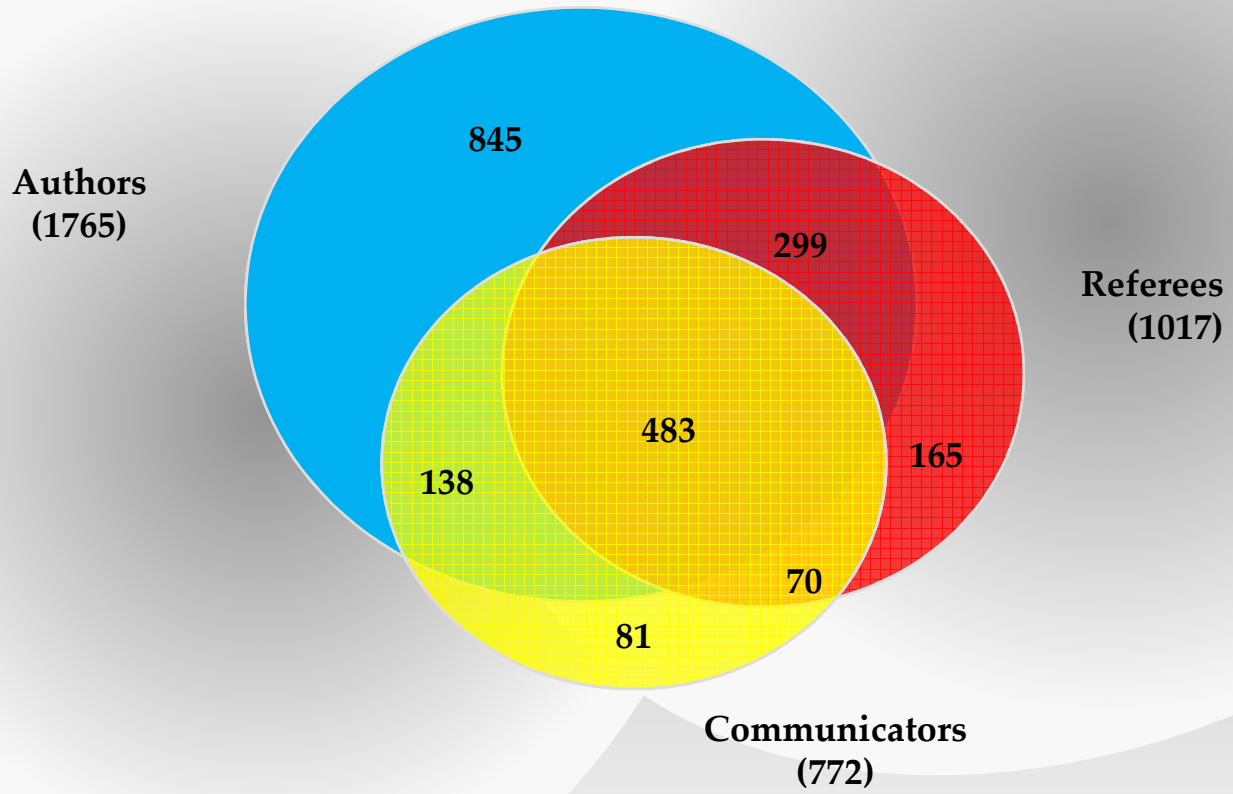
Historical Periods of Interests	
Time Period	Description
1853 – 1885	End of XIX, Stokes era
1886 – 1914	Before WWI, creation of A and B
1915 - 1939	Between Wars
1940 - 1966	After WWII

Editorial Decisions at the RS



NPB: not published or abstract without DOI or added to existing publications

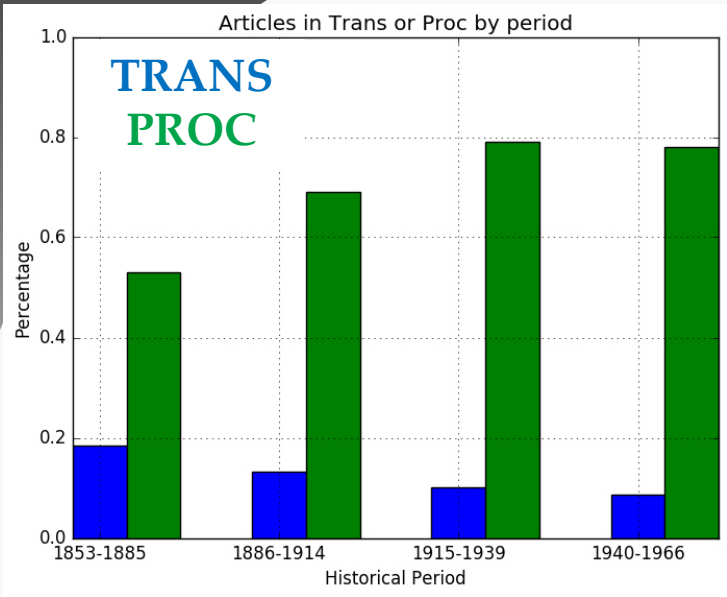
Communicators, Referees and Authors

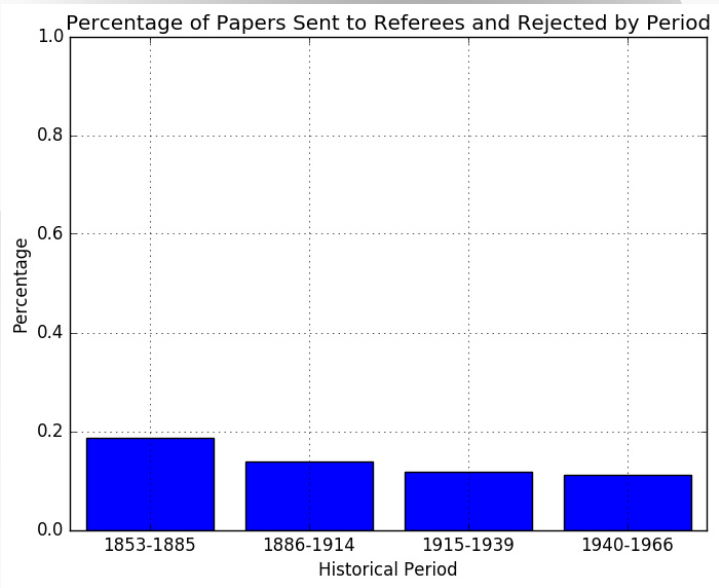


3600* Available FRS members
2081 FRS Members involved (**56%**)
1236 Involved in the Editorial Process (**34.3%**)

*3378 available data, the rest is an estimation

Some Editorial Process Statistics (1)

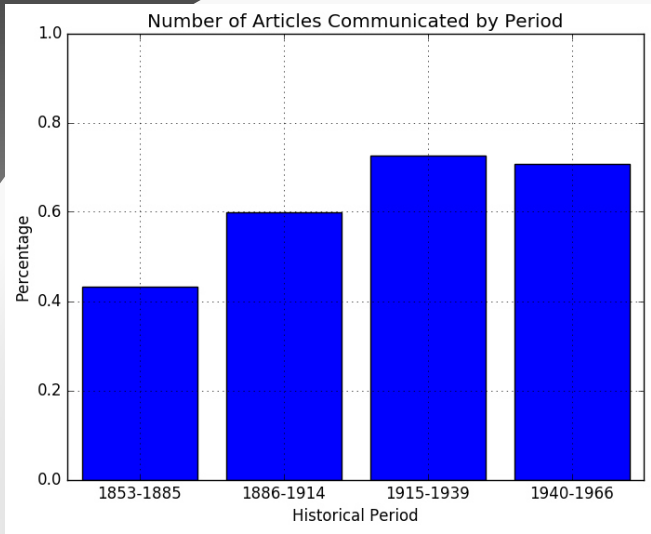




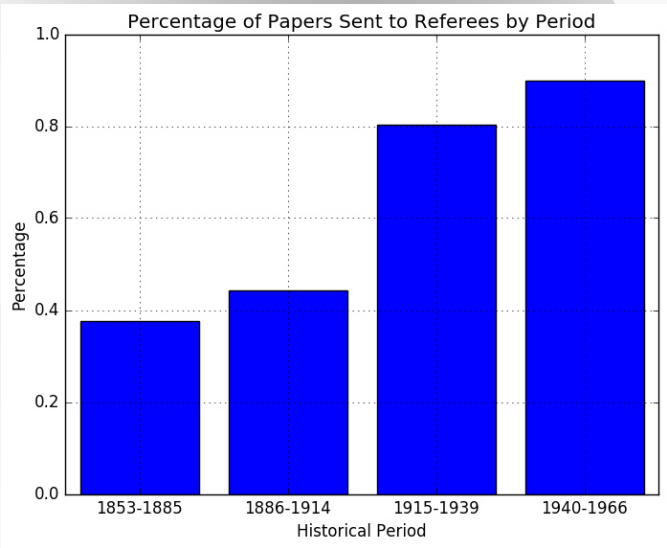
The majority of papers are published in *Proceedings*.
It is not that *Transaction* is getting smaller or more selective, it is *Proceedings* that is growing in size.

Rejection rate (of refereed papers) decreased over time, perhaps because of the changing role of *Proceedings;* or better pre-refereeing filtering
(st. bars)

Some Editorial Process Statistics (2)

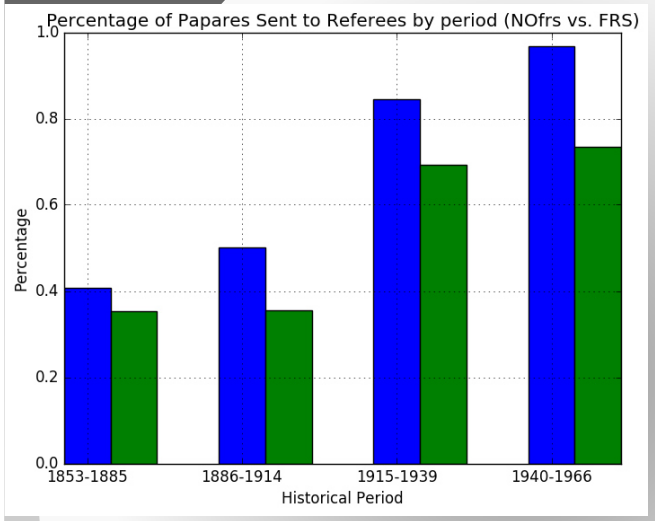


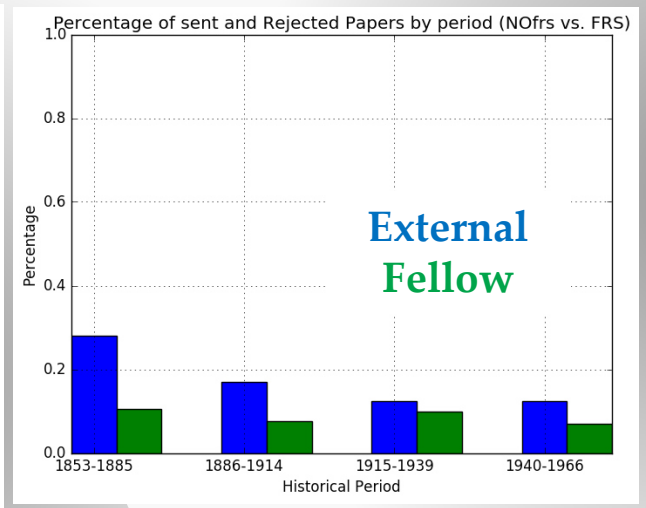
The percentage of external contributions increased over time. However, even at the end of the 19th century external submissions had already been more than 40% of the total

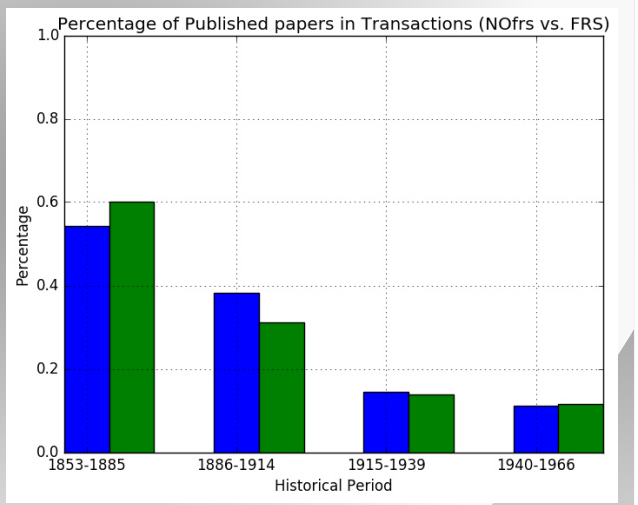


More papers were sent to referees over time. From 1930, all papers sent to referee, not only *Transactions*. Does this mean that the refereeing was becoming seen as essential?

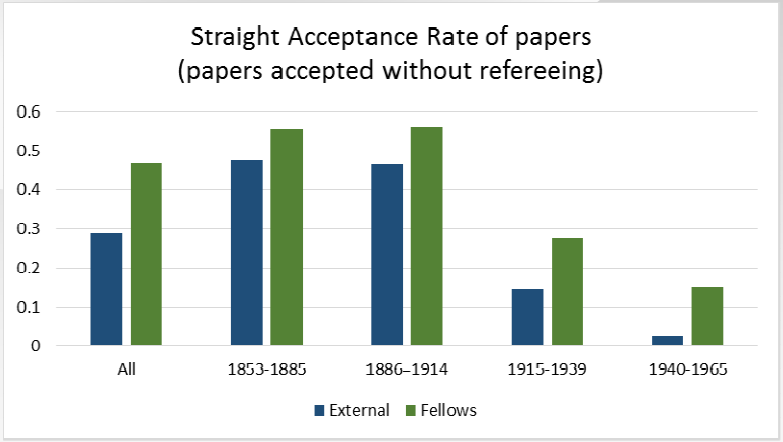
Fellows vs External: did they get the same treatment by referees?



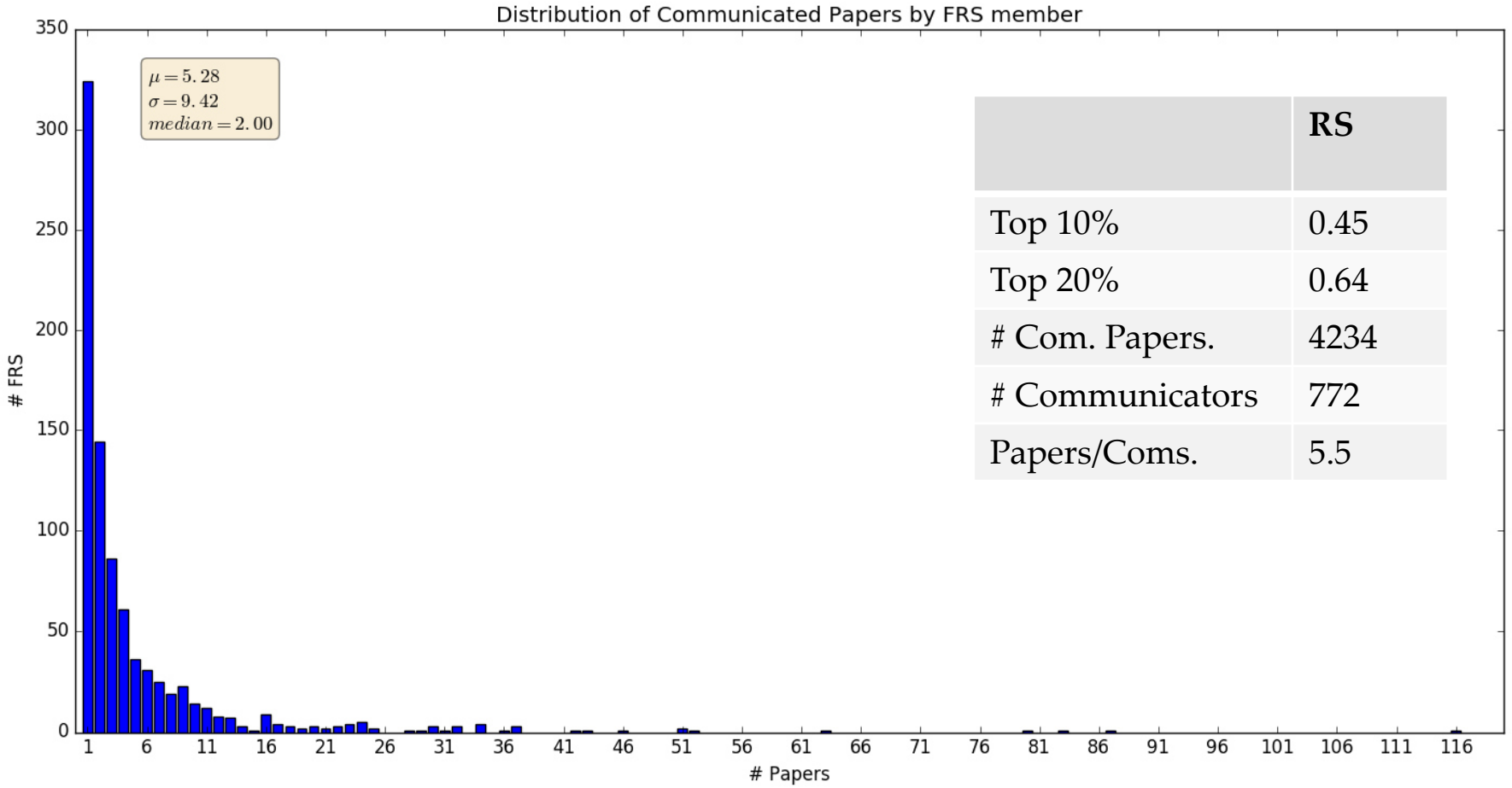




- External submissions more likely to be sent to reviewers
- External submissions more likely to be rejected
- Fellows had a much higher acceptance rate without refereeing process (mainly Proc papers)
- However, once external submission were accepted, they enjoyed the same rate of being published in transactions, around 13% for both the groups.

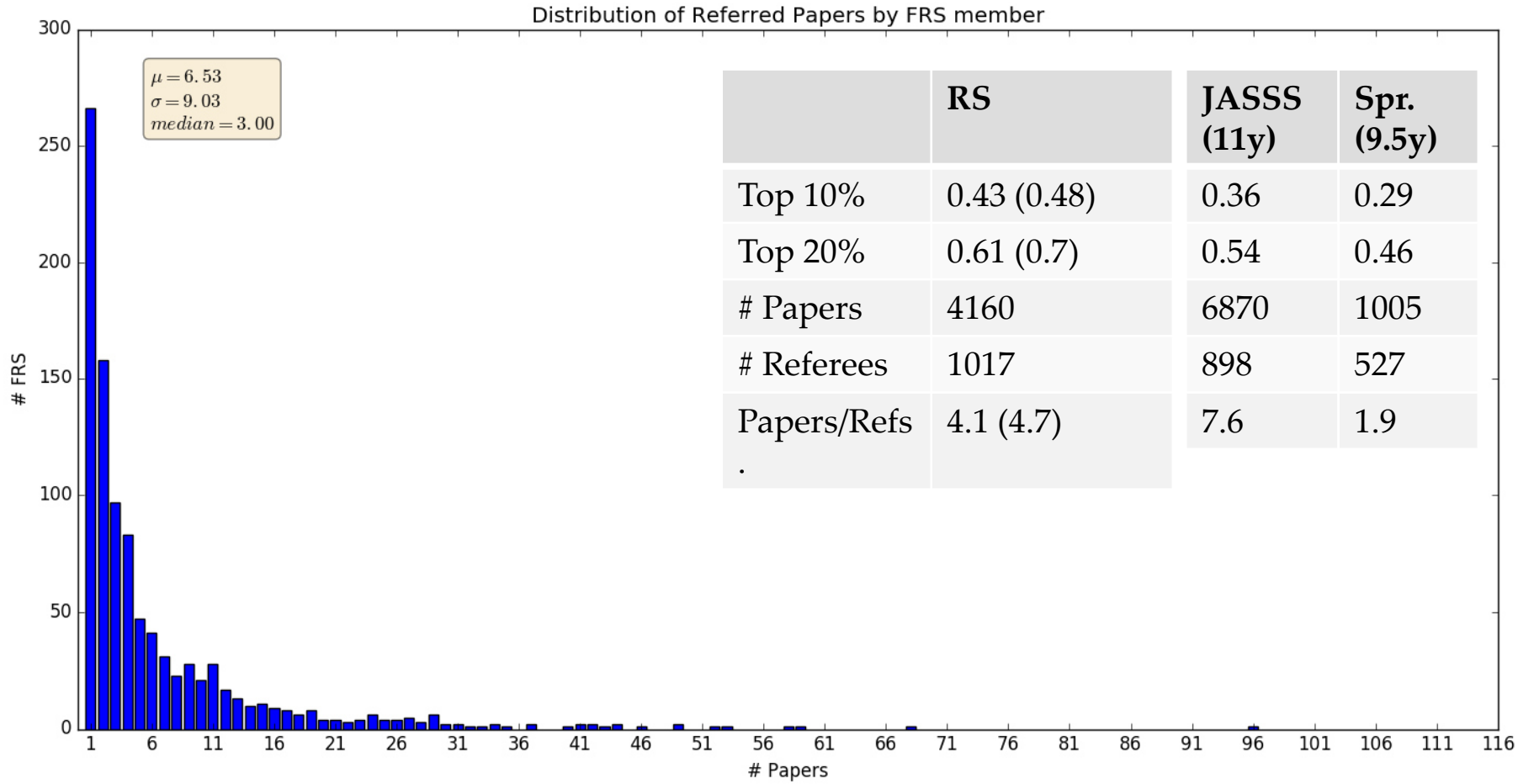


Distribution of FRS fellows by number of Communicated papers



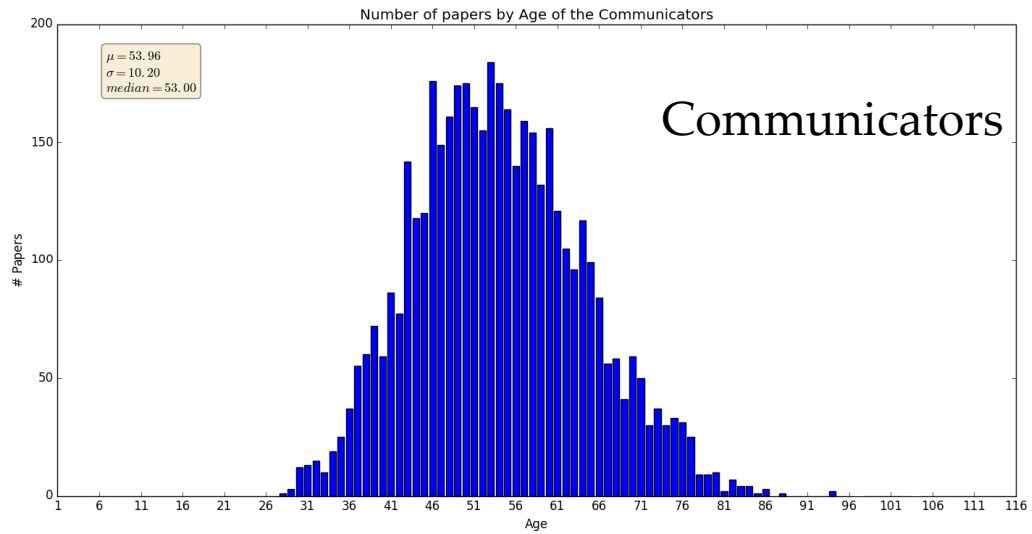
	RS
Top 10%	0.45
Top 20%	0.64
# Com. Papers.	4234
# Communicators	772
Papers/Coms.	5.5

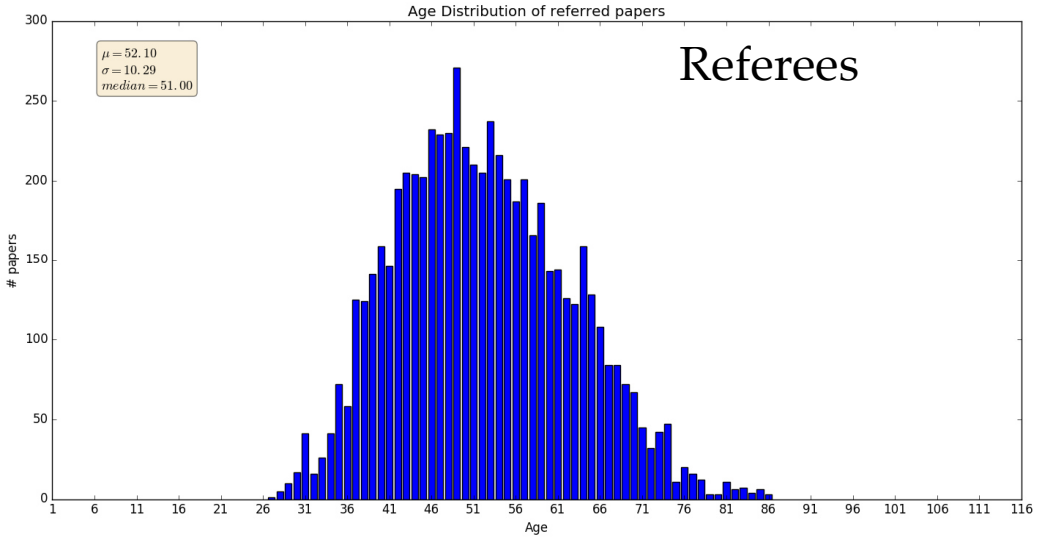
Distribution of FRS fellows by number of Referred papers



	RS	JASSS (11y)	Spr. (9.5y)
Top 10%	0.43 (0.48)	0.36	0.29
Top 20%	0.61 (0.7)	0.54	0.46
# Papers	4160	6870	1005
# Referees	1017	898	527
Papers/Refs.	4.1 (4.7)	7.6	1.9

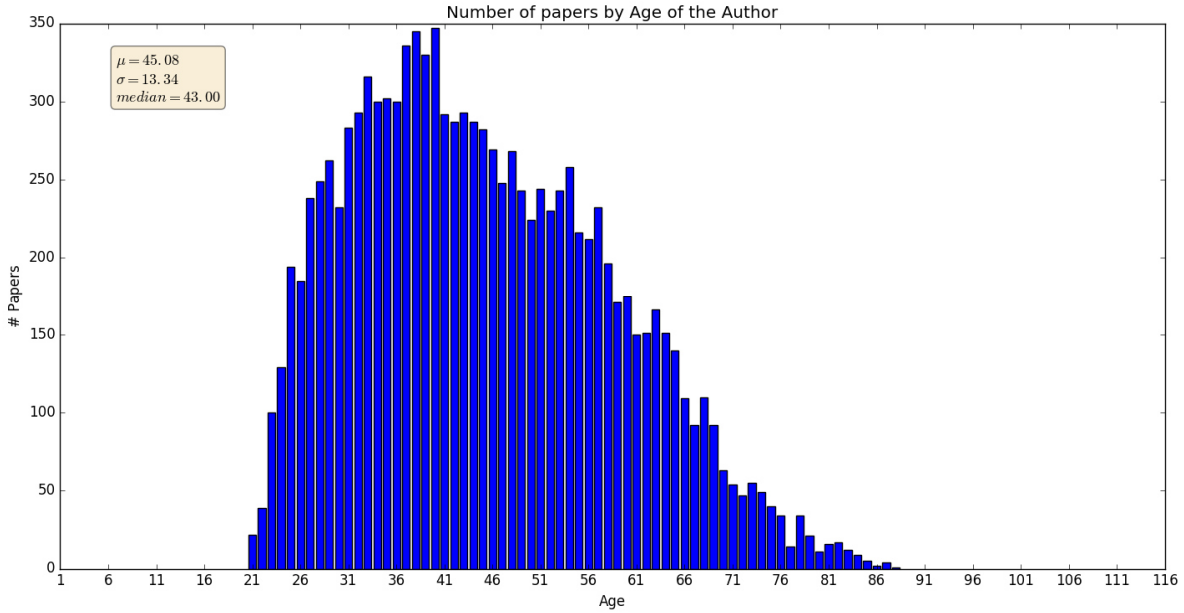
Age Distribution





- Bell-shape
- Quasi Normal Distribution
- Similar trend, communicators are "delayed" 2.5-3 years
- If we plot the same distribution by year of service, the median is 10 years, skewed distribution almost uniform between 4 to 13 years of service with a long tail

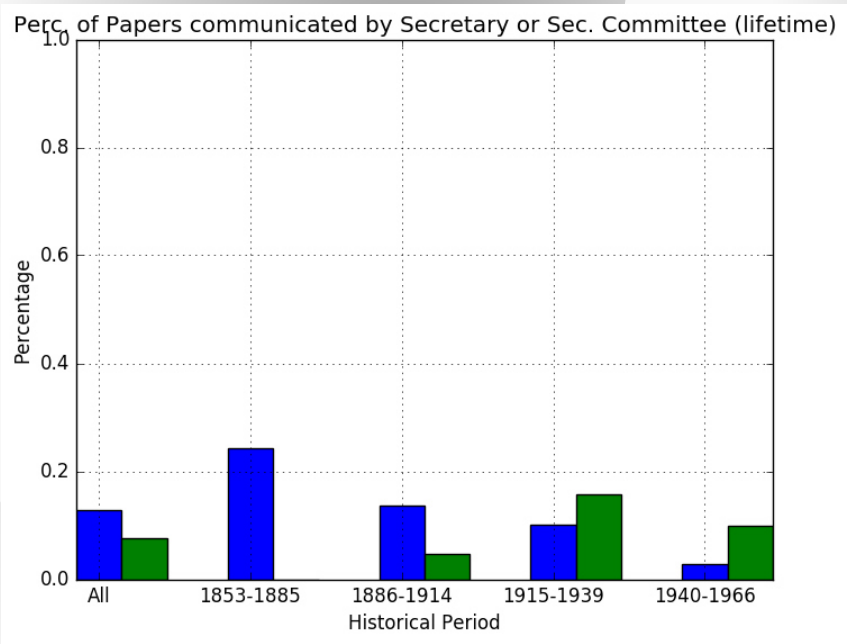
Age Distribution (authors)

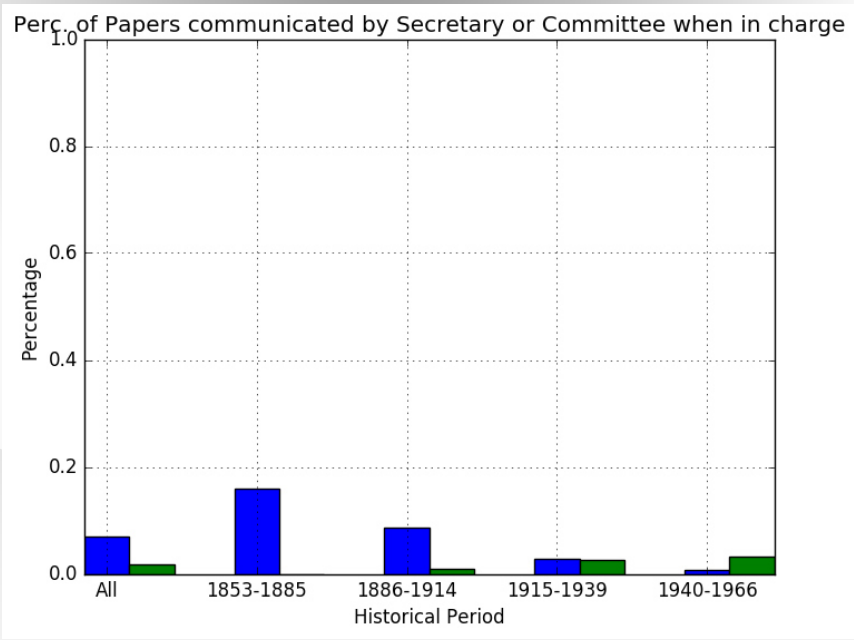


- Much more skewed distribution
- More active when they are younger
- Interesting analysis by subject
- Median is 8-10 years lower than referees and communicators

The role of Secretaries and Sectional Committee Chairs

- Secretaries and Secretaries of Committee were very active in communicating papers, like editors
- Were they responsible for all the communication process? What is left after we have accounted for them?





- The large majority of papers communicated were not from secretaries or Sec. Com. chair

Top 10 Communicators

ID	#Pap.	Name	Field	DoB
NA8283	116	Stokes G. Gabriel	Physics;Mathematics	1819
NA8278	87	Rutherford Ernest	Physics	1871
NA8289	83	Thomson William	Physics;Engineering	1824
NA8288	80	Thomson Joseph John	Physics	1856
NA7894	63	Larmor Joseph	Physics;Mathematics	1857
NA7273	52	Sharpey William	Medicine	1802
NA1395	51	Bradford John Rose	Medicine	1863
NA8281	51	Sherrington C. Scott	Neurophysiology	1857
NA8243	46	Huxley Thomas Henry	Biology	1825
NA6606	43	Rideal Eric Keightley	Chemistry	1890

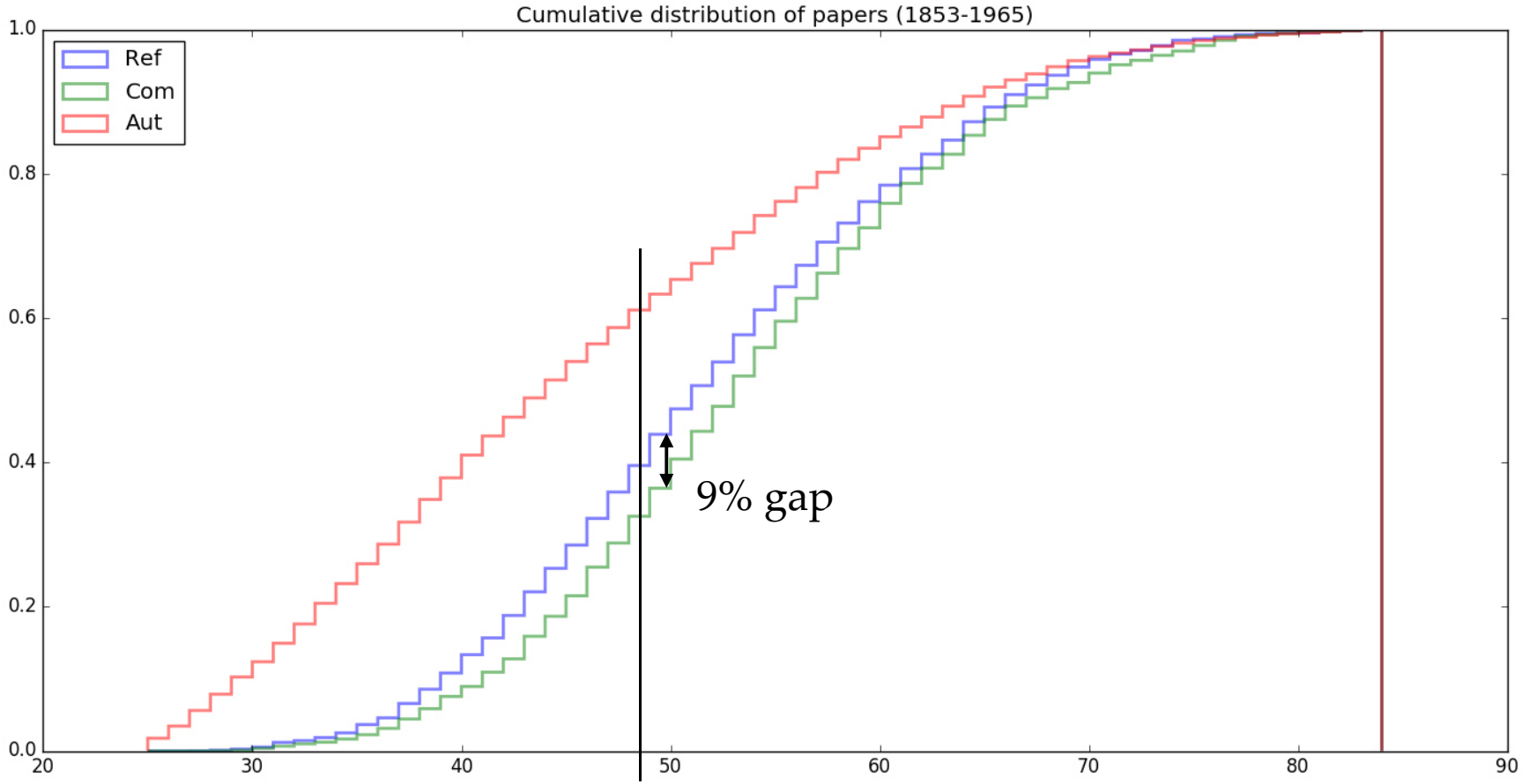
Top 10 Referees

ID	#Pap.	Name	Field	DoB
NA8283	96	Stokes G. Gabriel	Physics;Mathematics	1819
NA6602	68	Taylor Geoffrey Ingram	Physics;Mathematics	1886
NA8289	59	Thomson William	Physics;Engineering	1824
NA8259	58	Maxwell James Clerk	Physics;Mathematics	1831
NA7894	53	Larmor Joseph	Physics;Mathematics	1857
NA6483	52	Schuster Arthur	Physics	1851
NA3218	49	Mott Nevill Francis	Physics	1905
NA8243	49	Huxley Thomas Henry	Biology	1825
NA3216	46	Peierls Rudolf Ernst	Physics	1907
NA2448	44	Darwin Charles G.	Physics	1887

Success rate of Communicators. (number of published transactions papers communicated)

ID	Num.	Name	Field	DoB
NA6168	19	**Hopkins Frederick G.**	Biochemistry	1861
NA8288	17	**Thomson Joseph John**	Physics	1871
NA6944	12	Cayley Arthur	Mathematics	1824
NA8289	11	Thomson William	Physics;Engineering	1856
NA8243	11	Huxley Thomas Henry	Biology	1857
NA7273	11	Sharpey William	Medicine	1802
NA8283	10	Stokes G. Gabriel	Physics;Mathematics	1863
NA7894	9	Larmor Joseph	Physics;Mathematics	1857
NA8225	9	Glazebrook R.	Tetley Physics	1825
NA5307	8	C. Hugh Longbourne	Physics	1890

Comparing Com, Ref and Aut

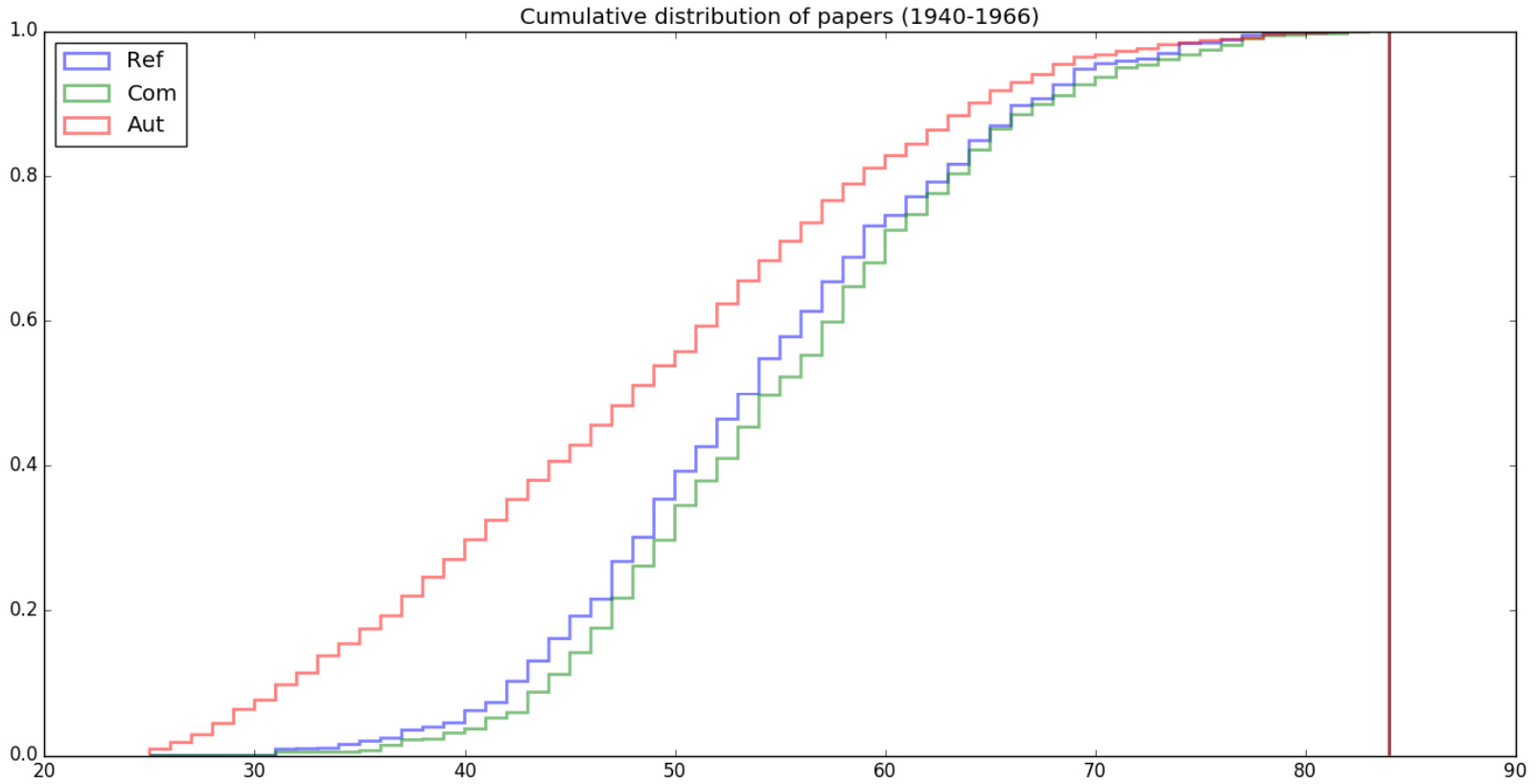


66% of members published on RS before election

Average Election Age is 49.2

Before: 0.59 , After: 0.61
1853-1885: 0.70
1914-1939: 0.48

Comparing Com, Ref and Aut by historical period



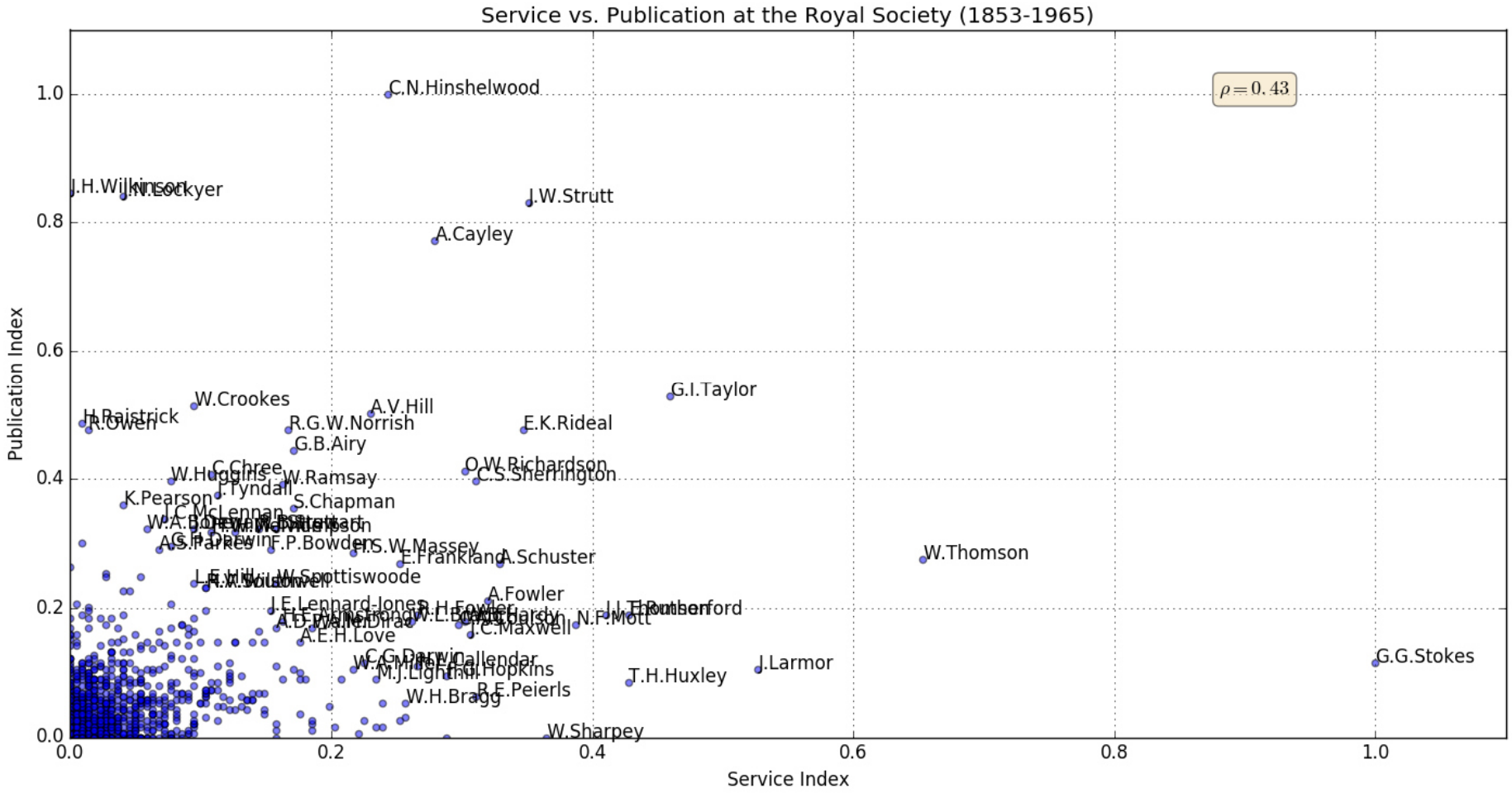
Biggest Com-Ref gap in older times.
Authors increase the distance with the other over time

Service vs. Publication Index

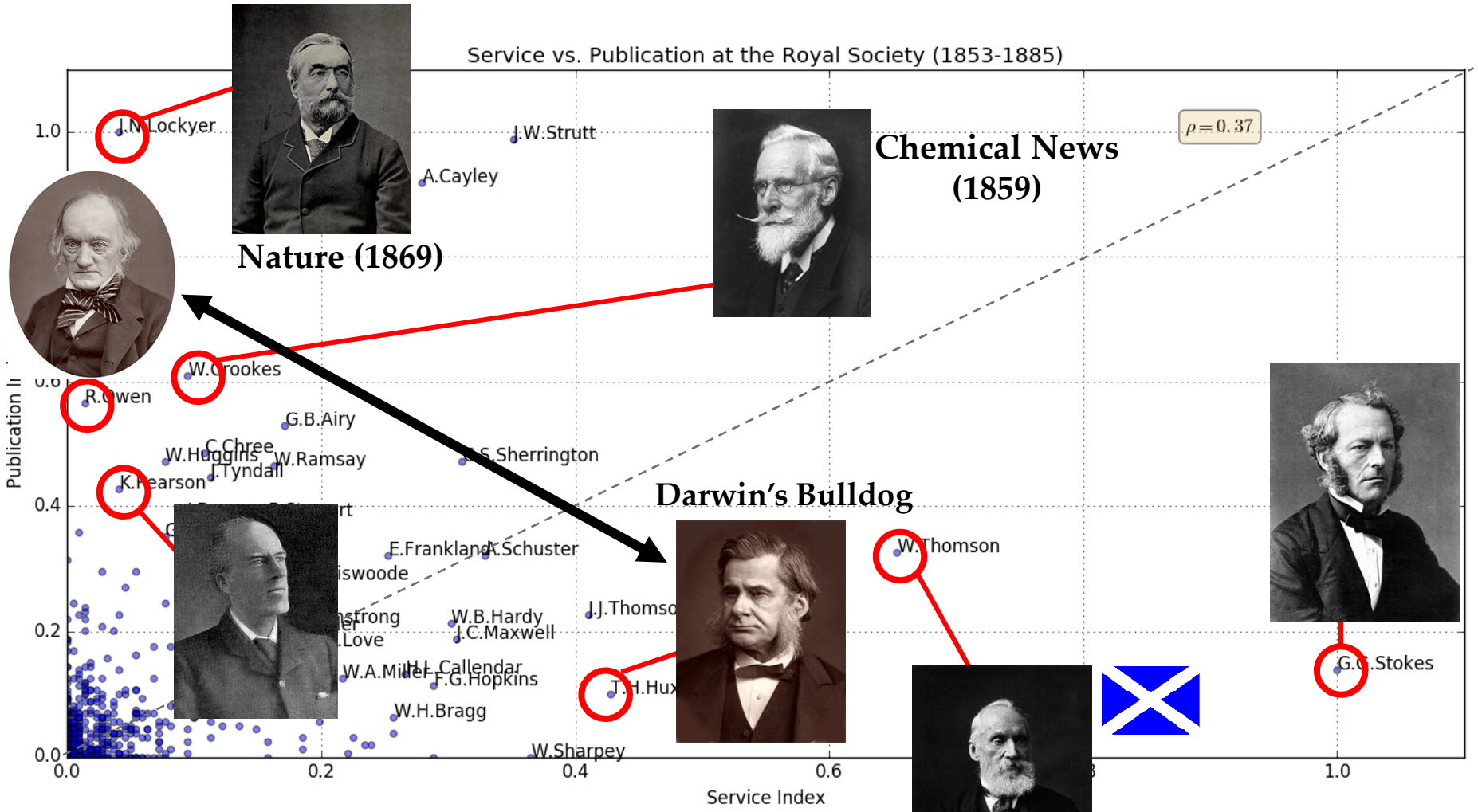
- We create a **Service Index** and a **Publication Index** for each member of the royal society
- **Service Index** is measuring the engagement of the fellow in the editorial process.
  - S = # communicated papers + # referred papers
- **Publication Index** is measuring the degree of scientific publication of the fellow on RS journals
  - P = 3*(# papers published on Trans.) + # papers published on Proc.
  - Higher weight for Trans papers

- There is a moderate correlation (r=0.43) overall, weaker in the older periods
- Many fellows with a high value for one indicator and low for another
- We plotted the indexes on a 2-D scatterplot

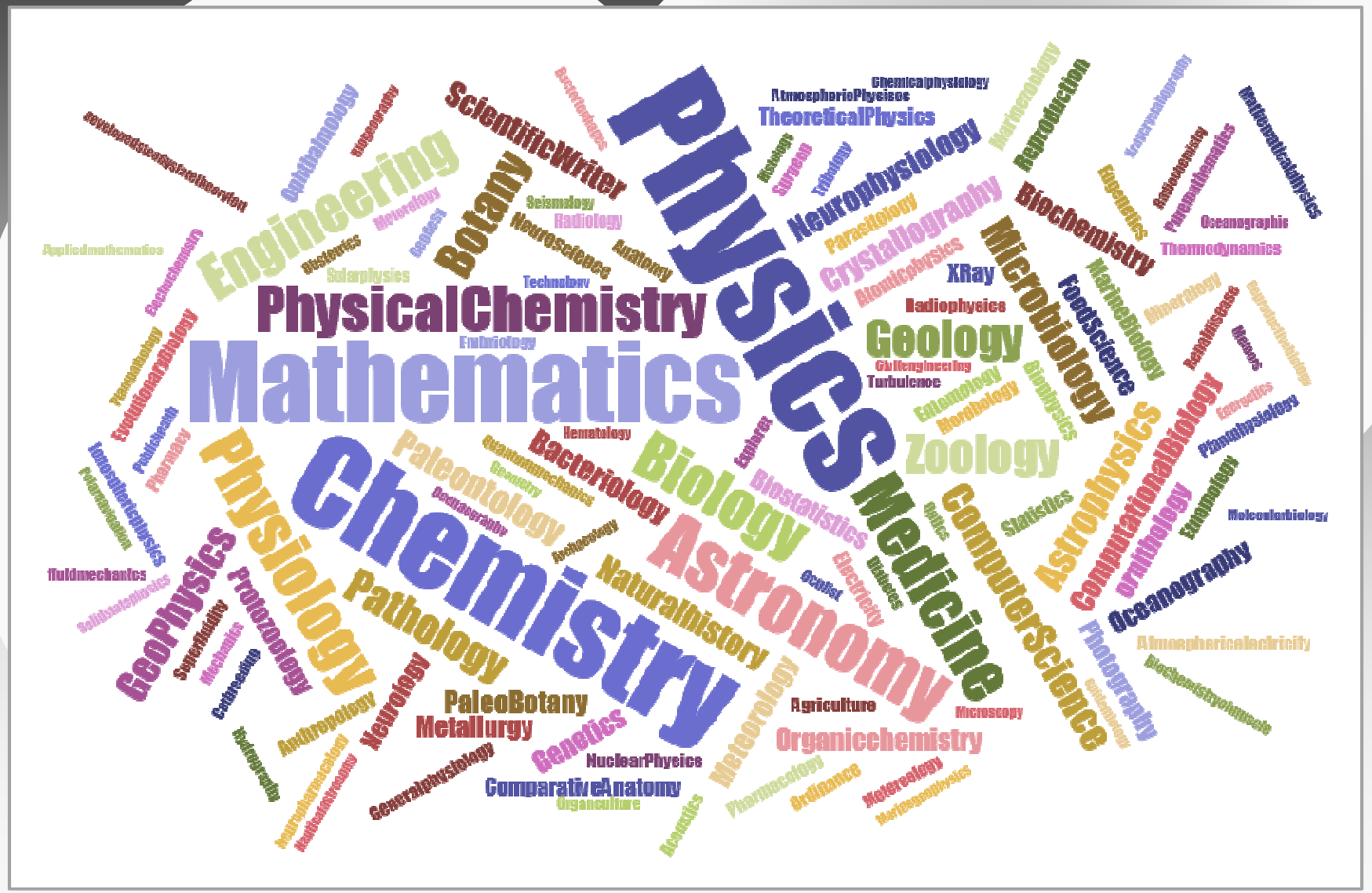
Service vs. Publications



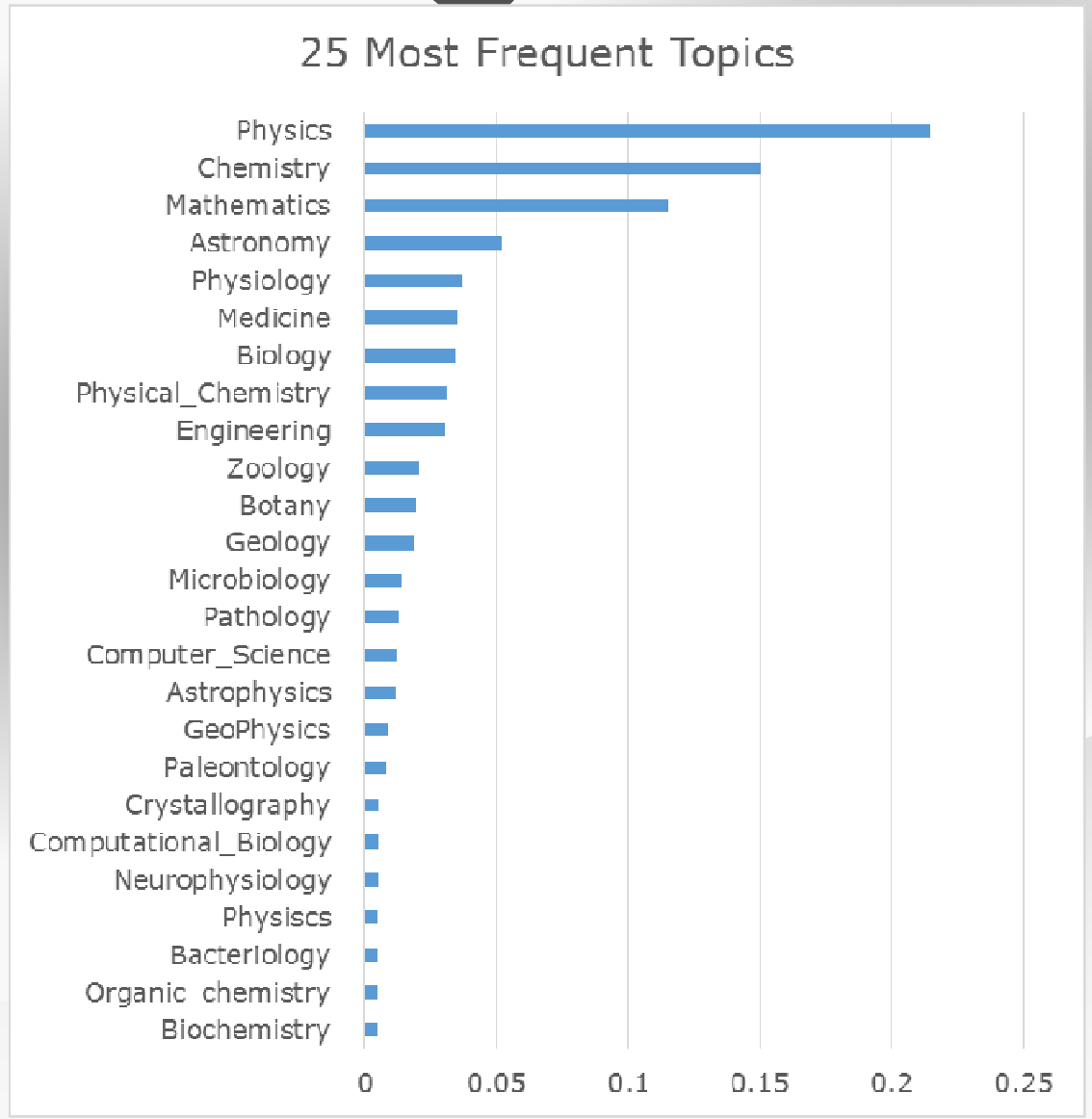
Service vs. Publications



Topics at the Royal Society



Top 25 Topics



Topic Analysis

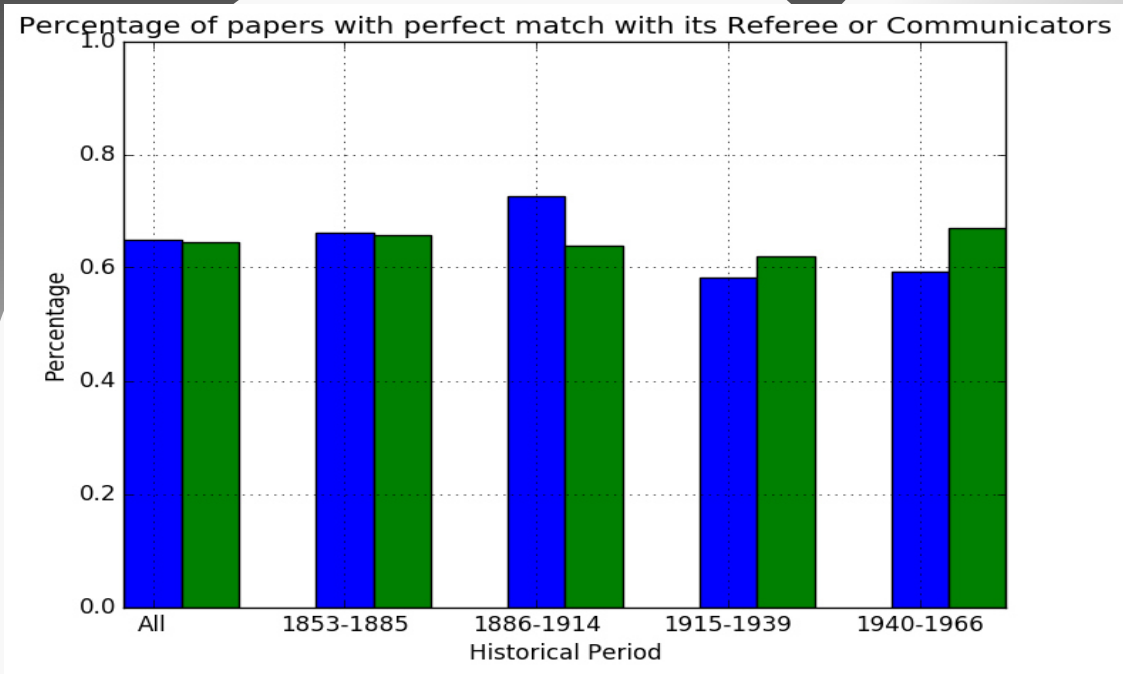
- What did the Communicators communicate? Was it in their field or they were communicating in fields where they were not expert (and therefore for social reasons rather than intellectual)?
- Earlier evidence from before 19th Century suggests that Communicator could suggest papers out of their field.

- We performed a topic analysis. We assigned topics (research fields) to:
  - Communicators, Referees, Papers

- We used RS website and Wikipedia to get the research field of Communicators and Referees. For papers, we first assigned the topic of the author and then we extended it with a text-mining classifier applied to papers
- Fuzzy Approach:
  - Not a single topic, but a set of topics assigned to scientists
  - Examples:
    - Stockes (Mathematics, Physiscs)
    - R. Owen (Palentology, Botany, Biology)

- Did communicators select papers on their field?
- How did it compare with Referees assignment ?

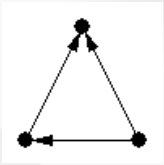
Topics Matching Results



Period	Mismatch Severity	
	Com	Ref
All	0.3	0.54
1853-1885	0.19	0.59
1886-1914	0.33	0.64
1915-1939	NA	0.37
1940-1966	NA	NA

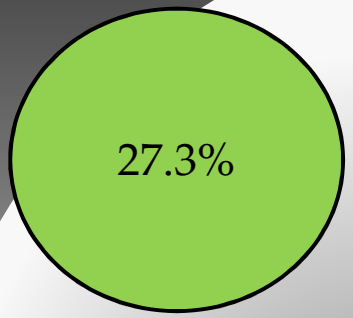
- Communicators were recommending papers in their field. Except for one period, there is no difference in the quality of the matching. One historical period is interesting
- When there is a mismatch, the severity of the mismatches by Referees is higher than the error of Communicators. Counterintuitive. Explanation:
  - Lack of referees in emerging fields?
  - Note: Severity of mismatch assigned using an inverse frequency approach

Description of (some) networks

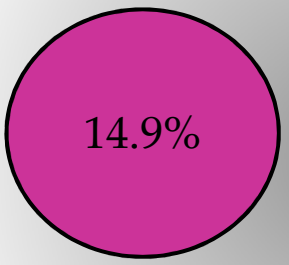
	(1862-1879)		(1905-1915)		JASS (11 yr)
	Ref-Aut	**Re-Au-Co**	**Ref-Aut**	**Re-Au-Co**	**Ref-Aut**
Nodes	555	596	1000	1037	1682
Edges	1215	1520	1716	2373	5627
Authors Only	353 (63.6%)	341 (57.2%)	695 (69.5%)	674 (65%)	784 (46.6%)
Referee Only	107 (19.3%)	141 (23.7%)	200 (20%)	236 (22.8%)	430 (25.6%)
Both	95 (17.1%)	114 (19.1%)	105 (10.5%)	127 (12.2%)	**478 (28.4%)**
Avg. Degree	4.37	5.1	3.4324	4.57	6.69
Acg. Cluster Coeff	0.107	0.105	0.032	0.054	0.025
Size of GCC	99.46%	99.16%	97.8%	99.81%	99.41%
Density	0.4%	0.4%	0.2%	0.2%	
Modularity	0.654 (8 com.)	0.631 (10 com.)	0.742 (11 com.)	0.665 (11 com)	**0.575 (14 com)**
Reciprocity (# bidirectional links)	**38 (3.14%)**	64 (4.21%)	14 (0.82%)	24 (1.01%)	76 (1.35%)
3-size Motifs					
	1.75% (0.55% t=15.49)	1.91% (0.61% t=19.4)	0.94% (0.23% t=16.77)	1.27% (0.29% t=26.23)	

Recurrent patterns: A communicates B -> A referees B and the opposite. A referees B -> A communicates B

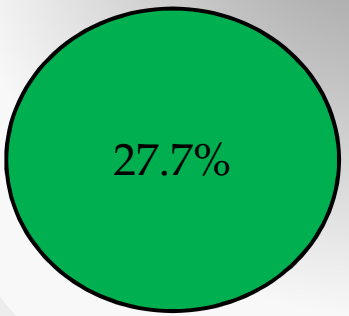
Cluster Analysis



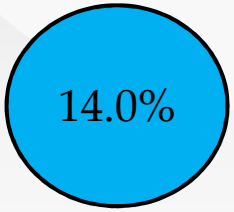
Biology with some Medicine



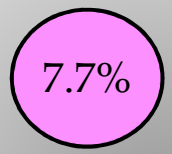
Mathematics



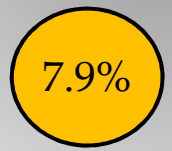
Chemistry , Physics



Mathematics, Physics



Mainly Botany and Geology



Medicine

Cluster 7 and 8 negligible. Few papers on Chemistry and Metallurgy

75.8% accuracy (3/4 papers in the cluster are compatible

Any lessons from the past?

- Responsibility for the editorial process lay with fellows of the Royal Society (refereeing pool was widened from 1968)
  - Decisions were collective/community-based, not made by individual editors
  - Although process was confidential, the credentials of the group were known
  - All involved were relatively senior/experienced
  - Communicators acted as a gateway/barrier to publication (it was abolished in 1990)
  - Despite having a closed pool of referees/communicators, acceptance rates suggest a fair process for non-members