How do journals publish research (what has changed in the last 300 years)?

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The basic structure of research articles hasn’t changed for 300 years

XXVI. An Examen of the Chalybeat, or Spa-Waters, called by the Germans Acid or Sowre-Brunns, or Fountains; but prov’d to be of a contrary Nature, that is, Alkali’s. By Dr. Fred. Slare, Fellow of the Coll. of Physicians and Royal Society.

I have, for many Years past, had more than a bare Suspicion, that Physicians and Learned Persons had imposed upon themselves and others Erroneous Notions about the Nature and Properties of those Mineral Waters, which are of the Chalybeat or Iron Species. Germany abounds much with these Waters, and they beflow one general Name upon them, and call them Sowre Brunns, that is, Sower Wells or Springs of Water.

1. I put but one drop of Oil of Vitriol to a large Glass full of strong Spa-Waters, which before the addition of this Acid did give a deep purple to the Solution of Galls; but now would not give the least Tincture, tho’ I put in four times as much of the Galls: From hence I conclude, that the Virtues of the Chalybeat Ingredients, which I take to be the Life and Soul

Let this be a caution to thosc that design to make these Waters pass better by Urine, that they do not make use of any Acids, it being a common Practice to use Spirit of Vitriol, Spiritus Nitr. dulcis, &c. as a Diuretick:

Phil Trans
Roy Soc
1712
is it evidence based?

- very little research on usability
- house style is usually arbitrary
What do journals do?

- Archive
- Check
- Selection
- Peer review
- Select
- 'Register'
- 'Seal of approval'
- Authorship
- Contributorship
- Correction
- Reporting guidelines
- Technical editing
- Metrics
- Commentary
- Debate
- Distribution
- Support network
- Entertain
- Permanent storage
- Retrieval
- Indexing
- Correction
- 'Seal of approval'
- Metrics
Oldenburg’s vision
(letters to Robert Boyle 1664-5)

- **Registration:** We must be ‘careful of registring as well the person and time of any new matter., … whereby the honor of the invention will be inviolably preserved to all posterity’
- **Dissemination:** By such a system ‘all Ingenious men will be thereby incouraged to impart their knowledge and discoveryes’
- **Archiving:** I should not ‘neglect the opportunity of having some of my Memoirs preserv’d, by being incorporated into a Collection, that is like to be as lasting as usefull’
- **Peer review:** Articles should be published after ‘being first reviewed by some of the members’ [of the Royal Society]

From Mabe Ch 17, *Academic & Professional Publishing* (ed Campbell, Pentz & Borthwick), Chandos 2012
Information distribution has changed

e-journals allow:

- changes in ways we find information
- different business models
- possibilities for Open Access
- faster communication with reviewers
- clever metrics
Some advances

- DOIs (reference linkage)
- CrossCheck / text matching software
- CrossMark (version control)
What works?

- Lots of evidence that following reporting guidelines improves quality


- Systematic review

- ‘Journal adoption of CONSORT is associated with improved reporting of RCTs’
Technical editing

- can improve readability
- can identify mistakes (increases accuracy)
- can reduce ambiguity

- Wager & Middleton / Cochrane review
- *JAMA* 2002;287:2821-4
BUT enforcing guidelines / technical editing is costly

- recent ‘high volume’ / author pays business models seek to cut costs
- many online journals do little or no technical editing
- rely on authors following guidelines
AND we know that authors don’t read guidelines!

- Pitkin
- The rewards of reading instructions from journal editors
- ‘if you have read this and call or fax our office, we will send you a gift worth $20’
- 17% of reviewers claimed the gift
- *NEJM* 1998;339:1006
Journals are happy to **endorse** reporting guidelines

- Hopewell *et al*
- Endorsement of the CONSORT statement by high impact factor medical journals
- *Trials* 2008;9:20
- 88% of journals surveyed (50/57) recommend authors should follow CONSORT
less happy to invest resources in enforcing them …

- Scott et al *Pediatr Infect Dis J* 2012
- Completeness of reporting in RCTs of 3 vaccines: a review of adherence to the CONSORT checklist
  - 20% stated in the title that trial was randomized
  - 37% indicated a primary outcome
  - 13% reported method of allocation concealment
Similar pattern for trial registration

- Kunath et al
  - Do urology journals enforce trial registration? *BMJ Open* 2011;e000430
  - 71% of RCTs published in journals requiring registration were registered

- Huic et al
  - Completeness and changes in registered data and reporting bias of RCTs in ICMJE journals. *PLoS One* 2011;6:e25258
  - 39% primary outcome field = missing
  - 78% registered after recruitment started
Peer review is fundamentally unchanged

- experiments with ‘social’ review failed
- *MJA / Nature*
- difficulty obtaining reviewers
Post-publication commentary / annotation has not replaced peer review

- some developments:
  - Faculty of 1000
  - Connotea / Mendeley
  - Rapid responses
  - Social media
but not a panacea

- Gotzsche et al *BMJ* 2010;341:c3926
- Adequacy of authors’ replies to criticism raised in electronic letters to the editor
- 45% of authors (47/105) responded to substantive criticisms
Resources are wasted ‘repackaging’ data
Very little automation

- templates
- data linkage
- figure generation
Some timid steps by publishers

- Elsevier ‘article of the future’
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The good stuff!
What do journals do?

- Archive
- Delay
- Bias
- Favour controversial findings
- Don’t want to curate data
- Restrict access
- Enforce copyright
- Prevent translation / adaptation
- Impose house style
- Favour positive findings
- Favour new findings
- Retractions not clear / not done
- The bad stuff!
Do we still need journals?

- Archive
  - Cloud storage
    - Retrieval
- Select
  - Check
  - Peer review
- ‘Register’
- Distribute
- Debate
- Social media
- Repositories
- Automatic templates
- Search engines
  - Altmetrics
  - Google Scholar
- Repositories
Do we still need journals?

Entertain

Support network

Version control

Correction

BMJ obituaries were the most widely read section ...
Words of wisdom from Richard Smith

‘What journals do best is stir up, prompt, debate, upset, probe, legitimise, and set agendas’

BMJ 2004;329:242-4