cholecystectomy in the UK. Recent data presented at both AUGIS and ASGBI have demonstrated a great variation in the practice and outcome for laparoscopic cholecystectomy. Firstly, in relation to index admission laparoscopic cholecystectomy following emergency admission to hospital of patients with acute gall stone disease; and secondly, emerging data to suggest that the volume/outcome argument is an important factor in morbidity and mortality after both elective and emergency cholecystectomy. As in all areas of surgery, the 'occasional' laparoscopic cholecystectomist should become a thing of the past, but increasing the rate of laparoscopic cholecystectomy during the same emergency admission will require service re-organisation in the majority of hospitals.

Figure 4: Robin Hood with current Honorary Secretary Ian Beckingham and current President Simon Paterson-Brown outside Nottingham Castle during a visit prior to the 2009 Annual Scientific Meeting

Training

AUGIS have introduced travelling fellowships for both trainees and consultants who wish to travel to other units, usually overseas, for a short period of time in order to obtain further experience in specific areas of upper GI surgery. To date, 28 such fellowships have been awarded for visits to a wide variety of countries including Europe, North America, Australia, China, Japan and the Indian subcontinent.

In addition to these travelling fellowships, AUGIS runs a very successful training day which precedes the Annual Scientific Meeting. This takes on a variety of formats according to the local organisers, but has included various simulated technical skills stations, rotation between various International experts to discuss difficult cases, lectures and viva practice for the Intercollegiate FRCS examinations. The day always finishes in a highly convivial fashion in a local hostelry. More recently, the AUGIS Council meeting, which also precedes the Annual Scientific Meeting, has been scheduled to finish at lunch-time to allow the council members to take part in the afternoon session of the training day, improving contact between Council members and trainees and reducing the cost of bringing invited speakers to the training day. A 'win – win' situation for everyone.

AUGIS are currently working on a programme for the introduction, training and subsequent mentorship/preceptorship for advanced upper gastrointestinal laparoscopic/thoracoscopic resectional surgery, and are hoping to take this forward with the ALS.

Finances

Like all medical societies, remaining on a sound financial footing is a key requirement and AUGIS have been very fortunate in their Honorary Treasurers, initially Sarah Cheslyn-Curtis (Luton) and now Nick Hayes (Newcastle), who have both balanced the books and indeed increased profits year on year. The costs of running a large Association, never mind the running of databases, the provision of training days and travelling fellowships, cannot be met by subscriptions alone and it is, therefore, imperative that the Annual Scientific Meeting provides additional income each year. AUGIS have been very fortunate to have seen a regular increase in income from these meetings, with a particularly good year in 2006, when the joint meeting with the IHPBA (organised by Professor James Garden) provided a significant profit to the Association. This allowed AUGIS to take forward the specialty databases and introduce the travelling fellowships.

Figure 5: Founding AUGIS President, Professor Robin Williamson

Figure 6: Past President, Mr Chris Russell

Administration

Like all national associations, the work carried out behind the scenes is immense, and AUGIS have greatly appreciated and benefited from the hard work of their Honorary Secretaries, Bill Allum (London), Chris Stoddart (Sheffield) and currently Ian Beckingham (Nottingham). They are, of course, very ably supported by the two Specialty Managers, Harriet Innes and Sarvjit Madhar, who are based in the Association of Surgeons offices within the Royal College of Surgeons of England, Lincoln's Inn Fields. Finally, of course, Associations such as AUGIS rely heavily on their membership to attend and contribute to meetings, become involved in the training and development of upper GI surgery and to encourage and support new ideas which have the potential to improve the quality of care and outcome for patients with upper GI surgical problems. We are indeed fortunate to have such a supportive and dynamic membership, to whom it has been my pleasure to serve for the past eighteen months.

Figure 7: Past President, Professor Derek Alderson

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DRIVING A BIG CITATION ENGINE

David A Rew

The Internet has transformed the search for information. Those surgeons of a certain age will recall the dreary hunt for papers and references on library shelves and in printed citation indices, and the long wait for posted copies of prized documents from a far flung reference library while writing up a Masters Thesis.

No more! Just as Search Engines such as Google have made global access to public postings and documents on the Internet virtually instantaneous, so a number of competing systems, each with different characteristics, now provide search functions for academic material, including peer reviewed papers, books, papers in trade journals, historical material, and multimedia material.

Internet publishing is a complicated environment. The established traditional "retail" publishers (eg. Elsevier, Blackwells, John Wiley, etc) make their printed content available on-line for a fee and through bespoke systems. Internet only publishers (eg. Biomed Central) are commercial companies which make their content available for free, but raise their charges and profits from the authors on a "pay to publish" basis.

Internet linkage and the publishers' own distribution systems have driven a massive growth in access to the scientific literature. For example, Elsevier's Science Direct system has provided such a successful platform for the distribution of our own surgical oncology journal, the EJSO, that it has been transformed in a decade from a regional journal with limited distribution to a world wide journal with from some 250,000+ full article Internet downloads in 2008-2009. This, in turn, has created a virtuous citation circle, and all other major journals have seen similar effects.

The Internet citation indices

The major citation systems bring the many thousands of publishers and their journals together into coherent structure. In effect, they act as wholesalers of intellectual content. They are also search engines for professional content, which divide into those which are free at the point of use, and those which charge access for their services and higher level functionality. The principal citation systems for medical and surgical literature are PubMed, a publicly accessible database of published papers and authors; Google Scholar, a derivative system of Google; Web of Science, the product of Thomson-ISI, and home of the Impact Factor, which lists and analyses some 10,000 journals; and SCOPUS, Elsevier's competing product, which now lists some 18,000 journals.

Models of access to professional Internet content

In general terms, listings, authorship and abstracts of published papers are readily and freely accessible on the Web. PubMed benefits from public funding. Google Scholar is free at the point of use but is funded indirectly by advertising. Additional functionality is expensive to deliver, and WoS and Scopus are necessarily funded by commercial, for profit, models. WoS and Elsevier then contract with the major publishers to include their content (blocks of journals) in their digital systems.

So far as access to individual papers is concerned, all of the major publishing houses now make the full content of their journals available through institutional and organisational subscription based services. Publishers protect their income streams by making full text content available on-line on a pay-per-view or institutional subscription basis, either directly or through the paid-for access to the citation databases. Licences for access to wide ranging content may be purchased by commercial bodies, universities, or even governments, and then distributed for free to their affiliated end users (eg. students). Direct access to the content of the commercial citation indices themselves may be negotiated on an individual basis for a fee.

Functionality of the major citation systems

The ethos of these systems, and the added value that they offer to the end user for their charges, lies in the structure, selectivity and quality thresholds which they impose upon their content. They aim to present "the best" and the most relevant material directly to the searcher, and thus saving the searcher time and effort. For example, the UK's Quinquennial Research Assessment Exercise is estimated to consume 10% or more of professional academic time. Capabilities currently being developed in the major citation systems will enable the academic output of entire institutions and their component groups, or even of entire countries over given timescales, to be collated, displayed and analysed in a few key strokes, once the systems are fully populated with reliable and agreed content. This includes published papers, books, conference proceedings, multimedia material and other forms of intellectual property.

Each of these citation systems is, thus, far more than a simple library substitute. Once digital data on authors, titles, journals, sources, abstracts and full text content is archived in the computers, a huge amount of derivative meta-analysis becomes possible. So does seamless linkage (at a cost) and navigation through the world literature, from reference to reference and text to text. The progressive capture and digitisation of journal content dating back to the 19th century, and of millions of the world's books (including scientific texts) by organisations such as Google hugely extends this utility. The net result of this process in time will be to make much of the human academic output of the past two centuries instantly accessible and visible, thus abolishing the concealing consequences of the passage of time.

Published text becomes searchable and readily compared with existing text, thus making plagiarism and publication fraud more transparent and more easily investigated.

The output of authors, institutions, and even nations can be measured easily, thus giving ready measures of gross intellectual product to employers, recruiters, grant giving bodies and governments. Changes in academic output over time can be assessed and analysed, making the funding of science and the allocation of resources much more efficient.

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The Challenge of the Impact Factor (IF)
The power of citation systems also allows new measures of the effectiveness or Impact of authors, papers and journals to be tested as alternatives to the current "gold standard", the ISI Impact Factor. This has a number of significant limitations related to timeliness and (incomplete) coverage of the literature.

The IF is a journal metric which measures the average number of citations to articles published in science and social science journals, as a proxy for the relative importance of a journal within its field. It was devised by Eugene Garfield, the founder of the Institute for Scientific Information (ISI). Impact factors are calculated yearly for those journals that are indexed in Thomson Reuter's ***Journal Citation Reports***. Importantly, the impact factor is specific to ISI data which is in private commercial ownership and which is not independently reproducible.
The IF for each journal is published annually on a rolling basis, and covers a three year period. In a given year, the impact factor of a journal is the average number of citations to those "citable" papers that were published during the two preceding years. Impact factors are published the year after the year to which they relate, when all data has been collated, and they only take into account relatively recent material.
New journals which are indexed from their first published issue, will receive an impact factor after two years of indexing. Journals that are indexed starting with a volume other than the first volume do not get an impact factor until they have been indexed for three years. The impact factor relates to a specific time period, and can be calculated for any period. The ***Journal Citation Reports*** (JCR) also includes a 5-year impact factor.

The Validity of the Impact Factor
The impact factor is highly discipline-dependent. The percentage of total citations occurring in the first two years after publication varies highly among disciplines from 1-3 percent in the mathematical and physical sciences to 5-8 percent in the biological sciences. Where the importance of a subject or paper is not recognised until some years after publication, the IF will not credit the relevant journal at the time.

The citation frequency and impact factor depends upon the number of journals on the system. SCOPUS lists and analyses some 18,000 journals, which yields different results for IF calculations in test series. The impact factor also refers to the average number of citations per paper rather an arithmetic mean, but the data on which it is calculated is not a normal distribution.

Scope for Manipulation and misuse of the Impact Factor
A journal can adopt editorial policies that increase its impact factor. For example, review articles generally are cited more than research reports, and review journals will tend to have the highest impact factors in their respective fields.
Journals can also change the fraction of "citable items" in the denominator of the IF equation. The types of articles which are considered "citable" are a matter of negotiation between journals and Thomson Scientific, which can produce wide impact factor variations. For example, editorials in a journal are not considered to be citable items. However, citations to such items will still enter into the numerator, thereby inflating the impact factor. There are ways in which a journal is able to cite articles in the same journal to increase the journal's impact factor.
The impact factor of a journal can easily exaggerate the importance of individual publications or researchers, who bask in reflected glory. Many papers receive few or no citations at all, even in prestigious journals. For example, some 90% of ***Nature's*** 2004 impact factor was based on only a quarter of its publications. Moreover, in the short term and in the low-impact-factor journals, **self-citations** to an article can substantially skew the calculations. The impact factor thus averages over all articles and thus underestimates the citations of the most cited articles while exaggerating the number of citations of the majority of articles. Focus is now shifting to assessing the quality and citation patterns of individual articles, rather than the reputation of the journal in which they are published.

Other measures of the impact of Journals

- The **immediacy index** is the number of citations the articles in a journal receive in a given year divided by the number of articles published.
- The **cited half-life** is the median age of the articles that were cited in ***Journal Citation Reports*** each year. For example, if a journal's half-life in 2005 is 5, the citations from 2001-2005 are half of all the citations from that journal in 2005, and the other half of the citations precede 2001.
- The **aggregate impact factor** for a subject category takes into account the number of citations to all journals in the subject category and the number of articles from all the journals in the subject category.
- The **Eigenfactor** is based upon the Page Rank algorithms which underpin the Google search engine. Journals are rated according to the number of incoming citations, with citations from highly-ranked journals weighted to make a larger contribution to the Eigenfactor than those from poorly-ranked journals. The Eigenfactor may be more robust than the impact factor, but the two metrics have been shown to be strongly correlated for medical journals.
- The **h-index**: Measuring the "Impact" of individual authors. The *h*-index (*Hirsch index)* aims to measure both the scientific productivity and the apparent scientific impact of an author or group of authors. It studies the author's most cited papers and the number and distribution of citations received in other publications.

The challenge of journal selection for citation indices
The world scientific and technical literature is expanding at an enormous rate. There are now believed to be some 200,000 citable regional and international journals in existence, and the numbers are expanding at a rate of some 4,000 journals per year. Of these, some 10% are believed to be in the medical and related scientific disciplines. Much important additional scientific and technical information emerges in non-peer reviewed "trade" magazines and publications, and in applications to patent offices.

To add to the complexity of tracking, searching and analysing this massive and uncontrolled volume of journals, many journals and magazines are published in local and regional languages; many have unconventional ownership models and production strategies; and many cease publication, fail or change their titles from time to time. The true scale of the world journal and scientific knowledge "pool" at any one time is thus far from clear.

There is now an intellectual imperative to develop commercially viable systems that link together the world's published scientific knowledge resources into coherent packages and to help to make sense of this data deluge. There is also a considerable development and management cost to systems which are capable of meeting the challenge, and commercial investment runs to the order of hundreds of millions of US dollars. Competition drives innovation, and a number of major organisations and software houses are making these investments to refine and test systems which make this functionality available to general users.

My experience with SCOPUS
During 2009, and building upon my experience in editing the EJSO, I was invited by Elsevier to take up a unique post as the Medical Chair of the new international Content Selection and Advisory Board (CSAB) of the SCOPUS citation system. SCOPUS has been under progressive technical development since 2002. It is now the largest searchable abstract and citation database of research literature and selected web sources, and it is continually updated and expanding. It currently holds the content from some 18,000 peer-reviewed journals from more than 5,000 publishers, including 1,200 Open Access journals. It also indexes 600 trade publications; 350 book series; 3.6 million conference papers; and 38 million archival records. Of these, half cover 1996 to the present, and the other 19 million cover the period of 1823 - 1996. The system also tracks more than 435 million scientific web pages; 23 million patent records from five patent offices; "Articles-in-Press" from 3,000+ journals, and links to full-text articles and other library resources. It also holds a further 4,500 titles in Arts & Humanities and Social Sciences from a range of databases. This aggregate capability represents an investment by Elsevier of many tens of millions of pounds/dollars/euros.

The SCOPUS CSAB comprises a growing team and committee of some senior international editors, one each from the major disciplines of the Arts, Humanities, Economics, Mathematics and Physical, Medical, Biological, Life and Social Sciences, along with senior librarians and other specialists. It is charged specifically with advising on the accession of journals to the system, and more broadly on advising on development directions and opportunities to make the system more useful. It meets at various locations around the world on an independent advisory basis to brainstorm issues arising from the development and capabilities of SCOPUS.

In its more specific remit, the CSAB editors do for journals what they previously did for individual manuscripts, in setting criteria and assessing quality for accession and retention of journals in the SCOPUS database. This is a unique opportunity to help raise standards in the world's literature.

To give some idea of the scale of the challenge, there are believed to be some 200,000 journals of varying quality, readability and Impact published around the world, although most are little known and "on the fringe", and only 20,000 or so are catalogued by the major citation systems. Which of these should accrue to the major databases, in what subject areas and in what languages? Following meetings in Amsterdam and Cape Town in 2009, the SCOPUS CSAB was, for the first time, able to set objective criteria with which journals could be assessed for credibility and utility, their content reviewed and reasonable measures set out for the improvement of journals which are deemed to fail as yet to justify inclusion.

Setting standards for journal accrual to the major citation indices
This poses real problems. For example, how should a journal published in a local language be treated? English has now become *de facto* the world's second language and its principal language of technical, professional and scientific communication. Would encouragement of the publication of abstracts in English help raise the accessibility and appraisability of obscure regional material? Should this be a criterion for inclusion? What editorial and review characteristics define a reliable ("strong") journal and an unreliable ("weak") journal? How many of the 180,000 or so unlisted journals should be listed, and what effort, techniques and expense should be committed to help raise them to list-able standard? How should the content of "trade" and technical publications (of which the ASGBI ***Newsletter*** is an excellent and readable example) be integrated into the citable literature? What quality and reliability factors distinguish the content of such products from that of peer review journals? How long should a new journal be left in incubation before accrual to the system, and how should those many journals which fail, close or amalgamate be treated? How can and should plagiarism and fraud detection tools be built into the system? These are very demanding questions with wide ranging Impact.

In little more than two decades, we have moved from the typewriter, the photocopier, the fax machine and the journal on the library shelf to seamless internet enabled production and worldwide distribution of the full text content of the world's literature. It is a great privilege to be closely involved in defining the standards and processes which will influence the quality and presentation of the world's scientific and professional literature in the coming decade as one of the Big Citation Engines builds up steam.