

The Experimental Scientist and His Literature Searches

D. A. A. Mossel
The University of Utrecht

D. A. A. Mossel, "The Experimental Scientist and His Literature Searches." *Proceedings of the IATUL Conferences*. Paper 11.
<http://docs.lib.purdue.edu/iatul/1979/papers/11>

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdue.edu for additional information.

THE EXPERIMENTAL SCIENTIST AND HIS LITERATURE SEARCHES

D.A.A. Mossel

Professor of Medical Food Microbiology, The University of Utrecht, The Netherlands

The problem

The discussion concerning the inundation of research scientists with Everest high mountains of literature has been going on, without interruption, since about 1945. In the last decennia, the situation has certainly deteriorated due to the almost endless appearance of new scientific journals and review series. This not only increases the need for more reading time but, as articles often appear with similar contents at the same time, covering the same original nature of the subject concerned, it calls for more critical reading, comparison with data already on file and a reluctance to file articles which have not previously been screened. In addition to this, many articles are published for no other apparent reason than that of the publisher wishing to fill his columns. Finally, Library Committees are confronted with the problematical choice of buying, or ignoring, "Handbooks" or Review Series which are often prohibitively expensive and which are, in many cases, completely outdated by the time that they end up on the scientists desk.

The execution of experimental studies without a thorough study of the literature available before undertaking the investigation, is something that has always plagued the Sciences. Previous work that had already been done in the same line was either ignored or it was even explicitly denied that similar investigations had ever been previously carried out. The more philosophically orientated scientist has frequently accepted this situation, taking into consideration that, were these investigations carried out properly, they would at least serve to substantiate earlier findings published elsewhere.

The time for change

This latter attitude became unacceptable when the world-wide depression of the early 1970's started to interfere with scientific research. Considerable staff reductions were a frequent result of the deteriorating economic situation, vacancies were no longer filled and so less and less time remained for research. Academic teachers were hit even worse. Due to the shortage of scientific staff, their teaching load was increased and reduced the

time available for theoretical classes, classroom experiments or clinical demonstrations. This gave rise to the demand for more rapid and reliable forms of retrieval of information.

Furthermore, sponsors of scientific research, whether industrial companies, government agencies or even the investigator's own University Committees, began to subject requests for grants to a serious scrutiny by using peer review procedures. These procedures, once again, called for rapid and reliable access to previously published information - ironically enough, not only for those begging for grants but also for those bodies administering the funds themselves...

Libraries appear to have acted quite adequately to this yearning for information by employing an intelligent procurement policy together with appropriate filing and retrieval systems and making use of inter-library co-operation. We, in the Medical Sciences, are often looked upon with envy by scientists of other disciplines as we are in possession of our famous Medlar System!

But, what about the users of all this information? Are they mentally equipped to keep up-to-date by making full use of the Thesaurus of information prepared for them by their librarians? Experience shows, that in this respect, scientists can be grouped in three classes. Included in these classes are: the conscientious reader, the browser and the fatalist. It has also become apparent that "telling" or "preaching" to the browsers and fatalists is of no help to them. Psychologists tell us, that taking the right decision, does not, by far, depend only on cognitive factors. The big drive behind behaviour is often emotional and is clearly and amply demonstrated by the practice of dangerous habits such as eating raw meat, smoking, overeating, driving under the influence of alcohol or drugs and the failure to take preventative measures in avoiding venereal diseases during sexual intercourse.

Fortunately, Medical Psychology can also give a pointer toward a solution to such problems. The reader can also be taught better habits in keeping up with available literature by the use of three types of measures. Persuasion, credibility and feedback: Persuasion, resulting from explicit case-study work and which demonstrates the waste of time, money and effect, being the inevitable result of ignoring the literature, is often an effective measure. The credibility of the instructor is also of paramount importance; if, in his own work, he practices what he preaches to others, he may be able to convince the latter of the correctness of his statements. Finally, full attention should be paid to the audience - communicator feedback loop; identification of the instructor with the student's problem rather than authoritarian barking or sneering can work wonders.

The rôle of the University

A crucial point in the relation of a scientist to his literature resources is, clearly, as to how well the University itself has prepared him for this essential part of his task. In our country, this aspect prompted a survey in which, with the professional help of Dr. Thomas Place of the Catholic University of Economy in Tilburg, we tried to find out how poorly or how well we had done. The guiding principle was based on the old Biblical expression: "From the fruits you will know the tree".

In total, 130 research institutes were sent a questionnaire. Of these, 67 % were Government controlled laboratories and the remaining 33 % were engaged in work for industry or commerce. The response was 71 %. Those who responded were not happy with the way in which we trained our students in the optimal utilisation of published information: 70 % of them considered that our alumni were inadequately prepared. Quite striking for the attitude toward literature, already mentioned in this paper, was, that despite this apparent deficiency of young university graduates, only 23 % of the respondents had investigated the capabilities of candidates as to whether they were able to handle information sources adequately, when new staff were being recruited. About the same percentage did provide thorough training for newly recruited scientific staff, irrespective of any pre-existing knowledge or experience in the field of information retrieval.

I would be doing my medical vocation a great dis-service, which is therapeutical rather than just diagnostic, if I did not briefly outline the steps which we subsequently devised and took in an attempt to remedy this situation. Inter alia, until now our experience has fully substantiated a reversal of the old proverb, that the road to good intentions is paved with Hell!...

Dealing with literature as an essential and perpetual part of the curriculum.

Introduction to the various sources of information should be provided is the first phase of scientific education. This will include familiarisation with the main periodicals, serial publications and handbooks. Not only that, but an explanation as to where these articles are to be found in the library and on the shelves is appropriate. After this basic education, the acquisition of information should be explained. Once again, the right attitude may be of more importance than just the plain facts. On the one hand, one should try to avoid inducing a neurosis about the incomplete covering of the literature but, on the other, the student should not adapt the tendency of being easily satisfied, often expressed in remarks such as: "There does not seem to be any data on - - - - -" Frequently, this is an indication that the student is not bothered enough to investigate further! During this first confrontation with the literature, a simple personal filing

system should be prepared, which allows for rapid and efficient retrieval of information. Finally, the student should be taught as to how the acquired information should be disseminated in a short oral summary and, how it should be put in writing. The more trivial aspects of reporting, such as breaking down into sections, paragraphs etc. as well as avoiding long sentences, should be stressed. The use of Tables and Illustrative figures as a replacement for "narrating" quantitative data should be encouraged - of course, avoiding the listing of repetitive sets of figures.

In the later stages of University Education, the use of the literature should be integrated into the various branches of science. It is here that the tutorial staff can set a good example by bringing recently issued text-books or pertinent original publications into the classroom or clinical demonstrations with patients. This, in the light of our own experience, serves to stimulate the student - it induces an attitude, that one should not take too much for granted before having looked at the literature. Obviously, it is the responsibility of the tutor that the students are brought into contact with the most relevant journals. They should justify their selection by pointing out the criteria determining the value of the particular scientific journal involved. This might incorporate a double referee system, one which relies on a team of internationally accepted experts who review the manuscripts in a constructive way.

Postgraduate, and certainly postdoctoral, programmes should include an introduction as to how the literature should be handled at independent research levels. The senior student should be shown the procedures which his supervisors and sponsoring agencies follow and apply these procedures for their own use. Having made a thorough study of the literature, they should use this as a guide in assessing the relevance, validity and attainability of that particular research they are planning to undertake. Once having started on this course, they should try to keep up with the field and use the only valid approach: following progress by monitoring the steady stream of literature. This also includes attending symposia or, at least, procuring the published papers or summaries of those meetings which are of significance and have bearing on the research at hand. The supervisory staff should make a point of stressing that it is only in this way that senseless duplication can be avoided as well as the running into "dead ends". This clearly gives rise to the requirement that the professorial ranks must continuously inspire their junior colleagues to this end and, as indicated repeatedly before, that they proceed in this manner themselves.

Epicrisis

It is not rhetoric, that most scientific libraries represent a veritable treasure trove of information. The standing of many Institutes bear direct relation as to how these treasures are put to use. Consequently, a cordial collegial co-operation between library

and research staff should be established. But, as one cannot be expected to appreciate something of which one has no knowledge, the library staff should, first and foremost, make sure that the scientist is introduced in the use of sources of information. Once this has been achieved, the scientists' ability to deal with the literature should keep pace with his own scientific development.

Acknowledgement

Most of the data in this contribution to the IATUL conference and the major part of its underlying philosophy has been taken from the paper: Mossel, D.A.A. and Place, Th. W. 1979. "The need for academic education in handling scientific information for students of empirical Sciences". (Translation of original Dutch title). *Universiteit & Hogeschool* 25, nr. 4, 280-297, 15 refs.

Unlike other Dutch Universities, the T.H.T. (as we call the university for short) has been designed, as far as the layout is concerned, on Anglo-Saxon principles, being set up as a residential campus. It is situated in what used to be a country estate which was comprised of a large park with surrounding farmland. As is usual with universities started on a campus, it provides on one single site, accommodation for everything and everything; laboratories, faculty buildings, management, students and staff. This experiment in social integration has not received much credit, nor has it met with much sympathy on the side of the students who appear to prefer having rooms in town rather than making use of the accommodation provided on the campus itself - in spite of - or possibly because of - this ideal accommodation. These peculiar circumstances have not stood in the way of the rapid, almost turbulent development of the university. It started off with three faculties: Chemical, Electrical and Mechanical Engineering. The teaching programmes were rather unique in that they offered a baccalaureate degree, or in use the French term, a licentiate, something new to this country and regarded with a certain amount of disfavour. This in conjunction with a "doctoral" degree which can be used as a stepping stone in obtaining one's Ph.D. As of this moment, quite a number of courses have