

C H A P T E R 1

INTRODUCTION

Purpose of this study:

This thesis is an enquiry into whether physics and astronomy journals in India reflect the status of research in these subjects in the country. If not, why not, and what could be done to improve matters.

One of the important channels of communication of scientific results is the scientific journal. The end product of any basic research work is its publication. If the research results are not **written** up and made available to the community by way of publication, they become sterile. Priority for a piece of research work is established by publishing the results soon after the discovery. Establishing priority for a work done is also considered important for getting peer recognition, awards and rewards. All these factors motivate a scientist to publish his research work. Thus, scientific journals play an important role in providing a medium for the scientist to communicate his/her research work

to others in the field and have become a part of scientific activity. To quote Meadows :

" The journal has become an essential component in the organisation of science, in the apportionment of recognition to scientists, and in simply reaching agreement on what constitutes acceptable science." (Meadows, 1978).

The growth of science journals in a country depends mainly on the level of scientific activity in the country, which in turn is a product of the interplay of different forces like the level of higher education, funding for research, the existence of professional scientific or academic bodies, and last but not the least, public support for science and technology.

P.L.Kapitza, one of the most well known Russian Physicists, wrote at the time of the centenary of the Russian journal **Journal of Experimental and Theoretical Physics** (in 1973):

" It is obvious that a close connection exists between the growth of the number of scientific journals and the scale of development of scientific work. This points to the possibility that useful data can be had about the organization of scientific work from a study of the number and character of the scientific journals." (Kapitza, 1973).

However, this is not true in all cases and there

could be exceptions. In this respect, India is a unique case and therefore, merits discussion.

If one identifies important journals published in a particular field and examines the articles published in them, it should be possible to get a picture of the level of the subject. This is true on a global scale. Similarly, when one restricts the choice of the journals to those published from a particular country and assesses the articles published in those journals, one would expect them to reflect the level of that subject in that country.

The broad features of the Indian scene are fairly well known. Too many journals are chasing a modest amount of scientific research output, a large part of which anyway goes to journals published in other countries. However, a detailed study of the phenomenon has not been reported so far. Hence the present study. As journals are an integral part of library collection in any scientific library, this study is of importance in the information field as it would indicate the role of Indian science journals as a medium of communication for Indian science.

SCOPE OF THE STUDY:

The present study is restricted to journals dealing with physics and astronomy, partly to achieve some focus and partly because **it** is in these fields that many major contributions have been made by Indian scientists, particularly the early pioneers. Moreover, some of the journals under discussion have been founded by these very pioneers.

The paradigm that the caliber of journals reflects the caliber of scientific research is applicable mostly to the United States and perhaps Western Europe. **It** applies to a certain extent to the USSR for two reasons: (a) the Soviet scientists publish **mostly** in Russian and (b) they are usually discouraged from publishing outside the country (however, this situation **is** rapidly changing in recent times). In China too, the forces of language and state restrictions restrain scientists from publishing outside. In Japan, the main reason for **publishing** within the country is the language barrier. But **if** one wishes to, one can publish in English and there are in fact English language journals published from Japan which many of the Japanese scientists use. (In recent years, Astronomers had to depend on Japanese journals to learn the results obtained from the Japanese

X-ray Satellite Ginga). Along with India, Latin America presents another example of an exception to the paradigm mentioned above. While it would be interesting to make a detailed comparative study of all the evolutionary patterns, that would be far big a task to be undertaken at present. Hence, the restriction in the scope of the work.

Methodology

The study analyses the emergence and the growth of scientific periodicals in India. A historical method of research has been adopted for the investigations. A chronological and developmental approach to the publication of periodicals has been followed. The socio-scientific context is used as an additional criterion. Further, in order to ascertain the status of science communication, interviews were held with both senior as well as junior scientists in the field, editors of scientific journals and science administrators. Lastly, inferential analysis has been used to derive information from the data so obtained.

Structure of the thesis:

The results of this study are presented in nine chapters as follows:

Chapter 1:

This sets the background for the study and defines the goals and scope of the thesis.

Chapter 2:

An analysis of the periodicals in science and technology in India from 1700 to 1900 is presented. **It** describes the contexts and the emergence of scientific research in India during the early period. One of the findings of this study is that in this epoch there were no "specialized" journals in Physics, Mathematics, Astronomy or Chemistry. Articles on these subjects were **published** in "general periodicals". In particular, there were no research periodicals in India during this period devoted exclusively to physics or astronomy.

Chapter 3:

The trends in scientific research during the period 1901 to 1940 are described here. It is found that organised research activity started during this period and a number of scientific academies and universities began to emerge. This period also saw the founding of journals in the field of Physics. Several eminent scientists used them as vehicles for announcing their scientific results.

Chapter 4:

This deals with the period from 1941 to the present day. It is argued here that during this period, the approach to scientific research had changed significantly. The growth of various scientific departments and research institutions in governmental and other sectors during the period are closely followed.

Chapter 5:

This chapter deals with the present scene in the publication of science journals in India and goes into the functioning of four important journals of Physics

and one of Astronomy. The origin of these journals, the response of the scientists to them, then and now, the refereeing system employed, composition of the editorial boards, their visibility, etc. are examined in detail.

Chapter 6:

This chapter goes into further detail concerning the five journals considered in the previous chapter. Also studied is the publication pattern of the **Indian** physicists and astronomers working in seven research institutions in the country.

Chapter 7:

A careful study of the growth, organisation and the success of two of the most well known Physics journals in the world **The Physical Review** and **Physical Review Letters** is made in this chapter. This is done mainly to highlight what makes a journal succeed and also to see if there are any lessons to be learnt from **it** as far as Indian journals are concerned.

Chapter 8:

This presents a summary of opinions expressed by scientists, editors and administrators concerning Indian journals and how they might be improved. These opinions were obtained during in depth interviews. It also summarizes the opinions expressed in this regard in publications and at conferences.

Chapter 9:

Consolidates the findings reported in the earlier chapters and gives the conclusion of the study. Suggestions of the author for possible improvements in the existing situation are also given.

R E F E R E N C E S

1. **KAPITZA, P L (1973) : Centenary of the Journal of Experimental and Theoretical Physics and the role of journals in the development of science. Soviet Physics Uspekhi, 16, 928**
2. **Meadows, A.J. (1979) : The Scientific Journal, London, ASLIB, 1979.**