The Development of the Pacific Science Reading Series
Neil Taylor and Rupert Alchin

Background and Context
In 1997, a project entitled Science Education in Pacific Schools (SEPS) was initiated by New Zealand Official Development Assistance and the UNESCO Office for the Pacific States to help improve the quality of primary science in twelve countries in the South Pacific region. All twelve countries were members of the University of the South Pacific (USP) and comprise the Solomon Islands, Vanuatu and Fiji from Melanesia; Niue, the Cook Islands, Tokelau, Tuvalu, Samoa, and Tonga from Polynesia; and Nauru, Kiribati and the Marshall Islands from Micronesia. Many of these nations are made up of large numbers of islands, making communications extremely difficult between and within countries. For example, the nation of Tokelau can only be reached by a ship journey of 36 hours from Samoa.

The island populations within the region vary considerably. Niue, a single island, has a population of well under 2000 with a single primary school and one secondary school, while Fiji, which is made up of over 300 islands, has a population of around 800 000 with about 700 primary schools and 140 secondary schools.

Science
Primary science has been somewhat neglected in the South Pacific, with previous aid projects in science education focusing mainly on upgrading secondary level science. This has meant that in many areas there are serious problems associated with primary science, and in some cases very low levels of science literacy exist amongst primary aged children. This has been having a consequent indirect effect in the secondary sector and even into the tertiary sector, where achievement in science has been poor.

The problems which exist in primary science in the South Pacific include inadequate training of primary teachers, large class sizes and in the final year of primary schooling, pervasive examination culture. These problems tend to result in a very didactic style of science teaching in the South Pacific. Acute difficulties also exist due to very poor resources in some countries. For example, Kiribati, Nauru, Vanuatu and the Marshall Islands each have a curriculum outline for primary science, but there are no special resources to help teachers deliver them. Since many primary teachers have a weak background in science, they often omit this subject entirely from the curriculum, particularly in the early years of primary schooling, and concentrate on those areas where they feel more confident. Clearly, this is a very unfortunate as at a societal level, primary science education has the potential to improve living conditions through addressing local problems with respect to such basic needs as clean water, sound nutrition, and personal health. Furthermore, there is evidence to suggest that the time spent on primary science has had a positive correlation with economic growth rate for a variety of nations.

Finally, a certain mystique appears to surround the subject of science in the South Pacific, as it does in other regions. Teachers and pupils often fail to see the relevance of what they are teaching or learning, and there is a sense that to be good at science one has to be particularly intelligent.

Literacy
Levels of general literacy are also a cause for concern in the South Pacific. In 1993, as part of the UNDP-funded Basic Education and Literacy Support Programme (BELS), a Pacific Islands literacy level test was developed and administered to sample groups of primary children in most of the South Pacific Island countries. The findings of this large-scale survey indicated that large numbers of children were under-achieving in general literacy across the region. This conclusion was based on literacy tests in English and in vernacular languages. Approximately 1/3 (English) and 1/5 (Vernacular) of the cohort were deemed to be ‘at risk’ of failing to benefit from further schooling.

As with science, many schools were found to suffer from an acute lack of literacy resources in both English and the local vernacular languages. Furthermore, it was noted that there was a need for teacher in-service on story book-based approaches and for curriculum development which included more books in primary literacy programmes, as well as appropriate methodology for their use.

Clearly, at the primary level in the South Pacific in both science and literacy, there has been a history of poor resourcing, which appears to impact adversely on levels of achievement in both these curriculum areas. Consequently, under the SEPS project, it was decided to fund the development of a high-quality, yet low-cost, science reading series. The intention was to present science concepts in a series of short readers, many of which presented science ideas within a fictional context. This format aims to make science more relevant to children and also develop their curiosity and understanding of the subject. At the same time the series was designed to improve their general literacy skills.

Science and Literacy Links
Science and literacy are inextricably linked. Without personal literacy, children find it difficult to engage with science and certainly the wider world of literature. Societies need literate people who are also scientifically literate as the two together enable people, both individually and collectively, to contribute to science directly and indirectly. Reading can enhance science learning, while science learning can extend the range of materials that children read.

Although practical experience is often an important element in a science unit, it may not always be the best way to introduce children to a new idea in science. Text-based materials, both fiction and non-fiction, can be used as an alternative. Many teachers already use stories as a stimulus for practical investigations. However, most stories are not written with this in mind, and any science must be teased out by the teacher.

Primary teachers in the South Pacific are expected to teach both literacy and science, so developing links between these two areas is economical in terms of cohesive planning and resourcing. There is plenty of scope for the use of stories in science as they can be used not only as starting points for pupils’ scientific questions, but also for discussion about issues and to provide the context for further investigation. Furthermore, science can act as a useful stimulus for literacy activities. Pupils can create stories based around their inves-
tigations and use them to explain their scientific ideas. These ideas underpinned the development of the Pacific Science series.

The Pacific Science Series

The idea of developing the Pacific Science series was to provide some good quality materials for the many primary teachers who were struggling without adequate science resources. The project was completed within a short time period (less than 18 months). The series was not intended as a complete science course in itself, but simply as a resource to allow primary teachers to deliver some science and generate enthusiasm for the subject amongst their pupils. Once more substantial course materials are produced, it is envisaged that the Pacific Science series will be used in a supplementary role to link science and literacy.

Because many teachers feel more confident in teaching reading, the Pacific Science series aims to deliver science concepts through high-interest stories, both fiction and non-fiction. This approach makes science less intimidating for teachers and pupils. Since lack of confidence in teaching science was cited by many teachers as a major problem, any approach which improved this situation and helped demystify science was seen as appropriate.

Funding from the SEPS project was provided for the development of a series of 10 science readers and an accompanying teachers’ resource book with activities for both science and reading programmes. Since local ownership of any project is of paramount importance, the series was developed at a regional workshop held in July, 1999 at the University of the South Pacific, at which participants from 12 South Pacific Islands nations were represented. Prior to the workshop an analysis of a number of the primary science curricula in the Pacific region was conducted. This helped ensure that the topics for the series were similar to those being taught across the region. Generally, primary science courses are divided into themes. For example, the main themes in Vanuatu are Living Things, Matter and Energy. In Fiji the themes are Life Science, Physical Science and Earth Science, while in Nauru they are Life, Energy, Earth Science, Matter and Time and Space. Thus there are strong similarities between these themes right across the Pacific region. Furthermore, many of the topics within these themes are very similar from one country to another. Consequently, the subject matter in the readers reflects these common themes and topics. This is an important issue in making the series equally relevant to all countries.

Each participant was asked to arrive at the workshop with brief outlines for three stories selected from a range of suggested topics. At the workshop the local participants initially received training in story-writing and editing from two editors from Learning Media, a New Zealand government-owned educational publishing company that does contract publish-
ABD 2002  Vol. 32  No. 4

11

Another reader, based on the ecology of mangrove swamps entitled *Black Sock Swamp* was trialed in three Samoan schools. One teacher commented, “The students understood the meaning of magic, but couldn’t see what was magical about the muddy and swampy places, until the text was explored further…”

A second teacher remarked that using this story made her realise that her class had very little knowledge of mangrove swamps and had no real understanding of their importance. These latter responses were quite encouraging as the mangrove swamp is an ecosystem under great pressure in the South Pacific, partly because few people are aware of its role as a nursery for juvenile fish, which fishing communities ultimately depend on. Clearly, if the Pacific Science series can help raise awareness of environmental issues such as these with young children, they may begin to develop positive attitudes towards their environment.

**Conclusion**

The Pacific Science series is a considerable innovation in a region where resources are scarce and often of poor quality. It is an attempt to provide good quality materials, written by local people, that link science and literacy. The trial indicated that teachers and pupils are receptive to these new materials, which is extremely promising. The principles behind the project are clearly supported by other writers in primary education, and it is hoped that the series will develop positive links between science and literacy so that they can help reinforce each other. The stories should act as a stimulus for simple, practical science investigations and help to demystify the subject in the South Pacific.

The series has been subsidised through funding from the SEPS project to make it affordable to Pacific ministries of education and schools. In addition, countries will receive funds from the SEPS project to enable them to buy school materials. It is also hoped that this series, written by local educators, will act as a model for others and that it will stimulate the production of science readers locally in each of the island states in English and their vernacular languages. Using the series may also encourage teachers to seek out fiction and non-fiction books to provide a stimulus for their science teaching.

**Note**

The Institute of Education at the University of the South Pacific (PO Box 1168, Suva, Fiji) is offering teachers in-service training in how to use the Pacific Science Series for both early literacy and early science teaching. The series itself is available from Read Pacific (PO Box 15339, New Lynn, Auckland, New Zealand), a widely respected book distributor in the Pacific.

**Neil Taylor**

He is co-ordinator of Primary Science Education at the University of Leicester. He also worked at the University of the South Pacific where he was the Project Officer for the Science Education in Pacific Schools project. This was a UNESCO/NZODA funded initiative. In June 2002 he will be taking up a new position as Lecturer in Science and Technology Education at the University of New England in New South Wales, Australia.

**Rupert Alchin**

He is the children’s science editor for Learning Media Ltd., a New Zealand based educational publishing company. His academic background includes both sciences and modern languages. Combining literacy and science is one of his particular professional interests.

**Reading Promotion in Lao PDR**

The National Library of Laos has been operating the National Reading Promotion Project since 1990. The project aims at upgrading and providing literacy awareness to children and adults in municipal and rural areas.

The main activities include distributing mobile library bookcases, story books, manuals, student textbooks and literature boxes containing about 250 different titles, to primary schools throughout Lao PDR.

In parallel with the distribution of mobile library bookcase, the committee responsible for the National Reading Promotion Project has also created a story-telling activity as an additional component of the project.

Vientiane Caravan Team is one popular activity of this project, which was established in 1997. Since its inception the team has already performed in various part of the country. The Vientiane Caravan attaches great importance to introducing stories and puppet shows to children, distribution of picture books, and promotion of reading and library activities to adults including parents, teachers, and staff working in the field related to children.

(by Soubanh Luangrath)