SUMMARY OF DISCUSSIONS

In discussing the subject of Low-Cost Science Teaching Equipment it was understood that science includes Mathematics and other related areas

LOW-COST SCIENCE TEACHING EQUIPMENT: TRAINING FOR PRODUCTION

Existing Sources of Equipment

Each country reported on the present situation regarding the supply of equipment and chemicals to their schools. Initially, or at some later stage, funds and/or equipment had been obtained through aid programmes but subsequent replacement of items or provision for an expanding system of schools was the responsibility of the countries themselves. This often led to the replacement of the more expensive items (e.g. UNICEF spirit lamps) by cheaper locally-made items (e.g. glass bottles with rag wicks). When items had to be imported, they generally came from traditional suppliers in the United Kingdom such as Griffin and George or Phillip Harris. Some supplies, particularly chemicals, were obtained through Australian or New Zealand firms such as Selbys. Generally, suppliers of science equipment or chemicals were not represented in the various countries.

As to why supplies were not obtained from the USA or from such areas in Asia as Singapore, Hong Kong or Taiwan, it was found that former traditional suppliers in UK were supported mainly because of the relative ease and of foreign exchange dealings. Often Asian suppliers preferred to work through Australian or New Zealand agents thus increasing their prices.

All countries reported long delays (typically six months but occasionally up to two years) from the time orders were placed until final delivery to individual schools. In the Pacific distribution over a wide area, breakage, and loss of items were ever-present problems.

Some items were available locally in each country through government stores or from purchases in commercial and private local stores. Items which could be recycled (e.g. plastic bags, cans, disposable syringes) were a major local source of equipment.

Funding was a problem in each country. Any funds available came directly from the ministry, from school fees or from self-help projects of parents and citizen/parents and teachers groups. Generally, funds were available on a school-wide basis with headteachers having final responsibility for division of votes among various subject areas. As a result no definite funds for procurement of science equipment or chemicals were known in advance. It appeared that typical science funding was of the order of 20c to 50c per primary school pupil and $1 to $1.50 per secondary school student.

Disbursement of such funds tended to be through the ministry for primary schools with more direct ordering for some secondary schools. Some

bulk ordering by a number of government ministries or a group of schools in a country did occur. Buying agents such as the Crown Agents were not used.

Maintenance, Repair and Production

Few schools, and then only at upper secondary level, in Fiji and Papua New Guinea had laboratory support staff who generally had very little training. Teaching staff were quite often too inexperienced themselves to carry out maintenance and repair. Thus equipment requiring repair was often put aside and neglected. A particular problem was that containers of chemicals deteriorated, occasionally with disastrous results.

A general lack of secure storage areas in most schools was reported; the most common procedure being storage of boxed kits in the headteacher's office or other such secure area. In some cases (e.g. secondary schools) adequate storage facilities were planned when building schools, but schools often operated long before any equipment arrived.

Apart from Australia and New Zealand, only Papua New Guinea and Fiji were producing equipment and even then only at the prototype stage. Fiji reported that a proposal was being considered to set up an equipment centre. In Papua New Guinea staff were in training for equipment production but these were to be more of administrators rather than actual producers.

The large amount of improvisation already implemented by practising teachers was noted together with efforts being made in teachers' colleges for students to produce as part of their training some items of equipment for their own use.

Activities in Other Areas, and Possibilities for the Pacific Region

The operations of the Scottish Schools Science Equipment Research Centre in Edinburgh, and the Consortium of Local Education Authorities for the Provision of Science Equipment in London were explained, and examples of their work displayed. Production units such as those established in Kenya, Turkey and Afghanistan were also considered. This resulted in a discussion of the possibility of setting up a regional equipment centre in the Pacific area. Recognizing the shortfalls and problems including limited funding within the Pacific area, and possible advantages seen by the establishment of such a centre, the delegates to the workshop recommended that a Pacific Regional Equipment Centre for Science should be established.

Roles of Specific Persons

The roles of teachers, curriculum development officers, financing officers, headmasters and other administrators in obtaining adequate low-cost equipment for science in the schools was considered only briefly. It was agreed, however, that the efforts of individual teachers should be acknowledged (e.g. by incentives) and further encouraged. Clearly identified objectives for national science programmes at each level of education should be set by all administrators, and where necessary priorities arranged.