1.1 Appropriate Technology and Community Environment, (APACE)
P.O. Box 770,
North Sydney,
New South Wales 2060,
Australia.

Functions: R & D; Information; Promotion; Consultancy.

Programme: APACE is a voluntary organisation, drawing its support and expertise mainly from university staff, and is active in two areas. One is the design (completed) and proposed construction of a prototype housing complex, to be powered by sun, wind and methane biogas. The other is a community development programme in the Solomon Islands. Projects underway include the design and construction of a cassava chipper and cassava pelleting machine; the production of alcohol from cassava; design of a vertical axis windmill; design of a simple DC/AC inverter; design of ice-making and coolroom systems for small-scale fishing project; analysis of cassava types in the Solomons; testing of water-pumping machine and micro-hydro-electric system; investigation of soap-making from hardwood ash. APACE keeps a register of consultant experts, provides free advice, and plans in the future to publish manuals/designs and to set up a workshop to produce simple furniture.

Publications: APACE News, an AT and Environment Newspaper, three times a year.

1.2 Appropriate Technology Development Group
20 Holdsworth Street,
Woollahra,
New South Wales 2025,
Australia.

Functions: Information; Promotion.

Programme: originally a consultancy service, the ATDG is now restricted to being a technical information service on AT for Australia and the South Pacific region. It draws on its members' expertise on wind-powered generators, small-scale sugar plants, biogas plants, and on the production of simple medical appliances.

1.3 Commonwealth Scientific and Industrial Research Organisation,
(CSIRO),
Box 225,
Dickson,
A.C.T. 2602,
Australia.

Programme: this organisation is financed by the Australian government, and carries out a very wide range of research; that of the Solar Energy Studies Unit (Box 89, East Melbourne, Victoria 3002) includes work on all aspects of solar energy, including water and building heating, distillation, fruit-drying, photo-voltaic conversion etc.

1.4 Intermediate Technology Development Pty. Ltd.,
87, Riawena Road,
Rose Bay,
Hobart,
Tasmania,
Australia.

Programme: recently established, with the encouragement of the government, to develop technologies and small industries suitable for an island economy which faces high unemployment and emigration to the mainland.

2.1 Agricultural Development Agencies in Bangladesh, (ADAB)
P.O. Box 5042,
Dacca 5,
Bangladesh.

Functions: Information; Promotion.

Programme: founded in 1974 (changed name to ADAB from AVAB in 1976), ADAB provides a link between voluntary agencies working on all aspects of agricultural development in Bangladesh. It organises monthly forums on specific topics, maintains a library for the use of voluntary agencies, and counsels and advises staff of such agencies; it maintains a disaster-preparedness office.

Its main AT work is in its monthly 'ADAB News', a 20-28 page bulletin with a circulation of 2,500 (which includes most government offices). This carries reports on agronomic trials, on the successes and failures of extension programmes, on seminars etc; and specific examples of village technology, such as a bicycle-type pedal pump (Nov.'76), methane biogas (Dec.'76), bamboo tubewells (Jan.'77), a root zone chemical applicator (Feb.'77), waterweed rake (Apr.'77), use of ground-water (May'77).

Comments: ADAB News is not confined solely to AT, and thus attracts a wider readership than pure AT information might do.

2.2 Appropriate Agricultural Technology Cell,
Bangladesh Agricultural Research Council,
130-C Road No. 1,
Dhanmondi Residential Area,
Dacca,
Bangladesh.

Functions: R & D; Evaluation; Information.

Programme: the AATC was set up in 1975, after a major seminar on AT. So far it has started assembling documents to be the basis of an information centre, and is coordinating study groups on draught power, post-harvest technology, irrigation, and agricultural work-shops, as well as a post-harvest survey and analysis group. It plans to publish a newsletter and technical reports, and will generally be the core of expanded AT work on agriculture, including finance of R & D work which it will initiate.

Comments: after some staffing problems, the AATC is now getting off the ground; other cells on non-agricultural technologies are planned.

3.1 Appropriate Technology Resource Service,
Christian Action for Development in the Caribbean,
P.O. Box 616,
Bridgetown,
Barbados,
West Indies.

Functions: Information; Promotion; Production.

Programme: started in 1976, after a regional workshop on A.T., ATRS is still only in its early stages. CADEC itself has a documentation centre, and publishes two monthly journals; it has been involved in the manufacture of solar water-heaters since 1974; and has six regional centres throughout the West Indies, involved in all aspects of development. ATRS will collect AT materials, disseminate them to regional centres and to any interested agencies, and put people in touch with sources of information on A.T.

Publications: 'Appropriate Technology for the People', (Report of 1976 workshop), which includes 74-item bibliography on A.T.

Comment: CADEC's case-study of its solar water-heating project, presented at an A.T. conference in 1977, provides a good account of the pitfalls and successes of commercial production of novel technology.

3.2 Caribbean Development Bank,
P.O. Box 408,
Wildey,
St. Michael,
Barbados,
West Indies.

Programme: this regional agency is proposing to establish an Appropriate Technology Unit, which would provide a technical information service, small industry extension service, and evaluation of AT projects, for the whole Caribbean region.

4.1 Appropriate Technology Centre,
Botswana Development Corporation,
Box 438,
Gaborone,
Botswana.

Programme: a governing body has recently been appointed to the ATC and funds are being solicited from the EDF, after which a manager and supporting staff will be recruited. The ATC will identify AT needs in Botswana, collect material from international sources and distribute these within Botswana, and coordinate AT work done in Botswana by different groups. It may be able to finance pilot projects which use innovative techniques.

4.2 Botswana Enterprises Development Unit,
Ministry of Commerce and Industry,
PMB 004,
Gaborone,
Botswana.

Programme: BEDU provides technical and managerial help to entrepreneurs in Botswana, and as such is an interesting and so far successful experiment in industrial extension. By June 1976 42 industries had been established, employing 434 people and with a total turnover of $1.4 million. While BEDU's criteria are viability and cost-effectiveness rather than appropriate technology per se, their interest in import substitution and employment creation make them consider closely the type of technology used in their projects. These include clay products, concrete products, clothing, furniture, tanning, school equipment, and building and construction work.

4.3 Pelegano Village Industries,
P.O. Box 464,
Gaborone,
Botswana.

Programme: a small organisation promoting and assisting a group of cottage industries in the vicinity of Gaborone. It's main fields of assistance are in advising on the establishment and management of small industries such as textile printing, food preparation and handicrafts and in identification of markets. Pelegano has recently developed some interesting AT techniques in local building and stone masonry.

4.4 Mochudi Farmers Brigade,
Kgatleng Development Board,
P.O. Box 208,
Mochudi,
Botswana.

Functions: R & D; Evaluation; Production; Promotion; Training; Information.

Programme: this brigade has developed and now manufactures for sale the 'Makgonatsotlhe' multi-purpose tool carrier, of which 35 were sold in 1975-76 (production is being expanded to reach 500 units per annum). This ox-drawn implement can be adapted for ploughing, planting, fertiliser application, for single and double row cultivation, and as a cart. It can also be adapted for pulling by donkeys. It is part of an extensive dry-land cultivation programme in Botswana. Programmes also include growing vegetables under netting (the nethouse being tested and used by many other brigade centres), and the cultivation of fruit/nut trees using surface water run-off.

Publications: 'Makgonatsotlhe: The Mochudi Tool Bar'; description and technical details available from the above address.

4.5 Serowe Brigade Development Trust,
Box 121,
Serowe,
Botswana.

Programme: this is the largest Brigade Centre in Botswana, with 240 trainees working in the following areas in 1976 - building, carpentry, textiles, mechanics, farming, forestry, electrics, plumbing, pottery, book-keeping and management. Among its A.T. activities are a windmill pump (in operation), methane biogas plants, earth dam building, and a nethouse for growing vegetables.

4.6 Rural Industries Innovation Centre,
Box 138, Kanye, Botswana
or c/o Box 18, Gaborone, Botswana.

Functions: Surveys; R & D; Production; Promotion; Information.

Programme: founded in 1974, RIIC surveys rural areas to determine both problems and the people's preferred solutions; develops prototypes, which are then tested in the villages for technical and social acceptability; selects a production group which also works on final design modifications; and organises credit, management advice etc. to the production group. Projects include mud stoves, handcarts, windpumps and generators, methane biogas plants, a solar cooker, mud dome and arch construction, furniture; and a wire-mesh fence-making machine, which is produced for sale and which RIIC itself uses to produce fencing for sale; a cement-block-making machine, produced for sale, which produces blocks of high quality; and a cement-tile-press. Blocks and tiles are mass produced.

Publications: Technical papers on Boloko (Methane) Gas plant, and on Kanye (Cement) block moulds. Extension survey results.

Comments: interesting for its attention to social aspects of technical innovation, and careful extension work.

5.1 Appropriate Health Resources and Technologies Action Group, (AHRTAG - UK),
85, Marylebone High Street,
London W1M 3DE,
England.

Functions: Information; Promotion.

Programme: set up in 1977, AHRTAG seeks to promote health care programmes which emphasize local involvement, preventive health and the use of indigenous solutions. It has a collection of 700 indexed and annotated documents, a permanent staff, and plans to assist individual countries to set up their own units to develop appropriate technologies for health; and in response to specific problems, to organise technical R & D and /or management solutions. AHRTAG is associated with I.T.D.G. and with W.H.O's Appropriate Technology for Health programme.

5.2 Intermediate Technology Development Group, (ITDG)
9 King Street,
London WC2,
England.

Functions: R & D; Evaluation; Promotion; Information; Consultancy; Production.

Programme: founded in 1965, ITDG now has some 50 employees and draws on the expertise of over 200 professional advisers. These operate in panels, on agriculture, building, chemistry and chemical engineering, cooperatives, ferro-cement, forestry, homestead technology, power, health, transport and water. Technical officers work in the field (as do consultants) and prepare specifications of products and processes, training manuals, catalogues and bibliographies. They and the London office provide technical advice and information to enquirers, and conduct original R & D work, in collaboration with other organisations and industries. Subsidiaries of ITDG market equipment and arrange consultancy services. ITDG assists governments and NGOs in developing countries in establishing national AT centres, to which ITDG assigns high priority.

Publications: Quarterly 'Appropriate Technology'; bibliographies; specifications for manufacture of tools and processes; manuals; special reports on notable projects; industry profiles. Full list available from ITDG. Topics covered include manual broadcast sower, welding jigs, treadle-operated groundnut thresher, ox-cart, donkey cart, poly-row peristaltic pump sprayer, hand sod seeder, pack saddle (complete technical drawings for all above); dimensional drawings with text of ox-drawn tools, clod crusher, tie-ridger/weeder, weeding attachment for Emcot toolbar, V-drag ditcher/bundformer, sled-type corrugator/irrigation furrow former, one- and three-row rice seeder, rotary weeder for row-planted rice, paddy puddling tool, hand-operated seed-dressing drum, toolbar, expandable cultivator and five-tine sweep cultivator, rotary corn thresher, groundnut lifter (for Emcot plough also), high-clearance rotary hoe, foot-powered thresher, roller thresher,

rice transplanter platform, cassava grinder, granule applicator, weeder mulcher, high-clearance peg-tooth harrow, triangular spike-tooth harrow, flexible peg-tooth harrow, Japanese harrow, oil-soaked wood bearings, ox and donkey carts, surveying levels, oil-drum forge (bellow and fan operated); also manuals and information sheets on tree crops, fish culture, land survey techniques, farm-equipment development techniques, winnowers, lime and alternative cements, building and construction generally, methane (several reports) including construction of bio-gas plants, nutrition, dental care, hospital equipment, iron foundries, candle-making, village workshop design, metal-bending machine, Chinese chain and washer pumps, hand-dug wells, rainwater catchment tanks, hydraulic rams, waterproof membranes, salawepump, water treatment, windmills; plus manual, reports etc. on small-scale management, accounting, cooperatives, and AT generally.

Comments: probably largest single AT organisation in the world; its publications include details of many of the products and processes reported in this directory; has received large funding from ODM (British aid) for dissemination of AT information.

5.3 Ministry of Overseas Development,
Eland House,
Stag Place,
London SW1,
England.

Programme: ODM supports the Tropical Products Institute, Transport and Road Research Laboratory, Building Research Establishment, National Institute of Agricultural Engineering, all of which are involved, to a greater or lesser extent, in AT work. ODM has recently allocated money specifically for the support of the dissemination of AT information in developing countries.

5.4 National Centre for Alternative Technology,
Llwyngwern Quarry,
Machynlleth,
Powys,
Wales.

Programme: public demonstration centre of many aspects of AT in-action; the Centre publishes plans ($0.50 each) of 4 types of windmill, and of solar roof panels, a timber waterwheel, and a solar water-heater. Mail-order bookshop - list available (send postage).

5.5 National College of Agricultural Engineering,
Silsoe,
Bedford, MK45 4DT,
England.

Functions: R & D; Evaluation; Training.

Programme: the College has designed, developed and tested two low-cost machines for agriculture. The 'Snail' is a small self-propelled winch which can pull a manually controlled implement such as a plough through hard compacted soils; it provides a much higher draught force than a single-axle tractor of equivalent size and weight. The 'Spider' is a light-weight three-wheeled tractor, having a transverse-mounted engine with a chain drive; no gearbox or differential is required.

5.6 National Institute of Agricultural Engineering,
Overseas Department,
Wrest Park,
Silsoe,
Bedford,
England.

Programme: with a staff of 15, the department advises the British Ministry of Overseas Development, and foreign governments, on agricultural engineering problems. It undertakes limited design,development and trials of AT equipment, which has included a simple water pump, animal-drawn toolbar, mini-thresher, machine driven auger-type conveyor for loading groundnuts, and a conveyor for bananas, hand-operated winnower, fungicide applicator. Current work includes development of a cotton stalk puller. Bulletins describing the above are available. The department also provides an information service, answering technical enquiries from overseas.

5.7 Oxfam,
274, Banbury Road,
Oxford,
England.

Programme: Oxfam is a large charity, with sister organisations in Canada, Australia and the USA, which finances programmes throughout the developing world, concentrating mainly on rural projects which help the 'poorest of the poor'. It has done some R & D of its own on low-cost housing and sanitation, (results published), has a technology unit in Oxford, and funds various projects with an AT component.

5.8 Tropical Products Institute, (TPI)
56-62 Gray's Inn Road,
London WC1X 8LU,
England.

Functions: R & D; Information; Consultancy; Training.

Programme: with a staff of 380, TPI is part of the British Ministry of Overseas Development, and is concerned with scientific, technological and economic problems of post-harvest storage, preservation, processing, marketing and utilisation of plant and animal products. Its information service answers queries on all tropical products' problems; TPI has a library with some 110,000 items. Among products and processes developed by TPI are transportable charcoal kilns, fish-smoking kilns and stills for the production of oil from limes, cinammon etc; a groundnut sheller feeder device, coconut grater, pedal-operated grain mill and pedal-operated rice-huller; techniques for cassava storage; methane (biogas) plants; building materials especially particle boards from timber, groundnut husks etc.; the utilisation of fish wastes; a hand maize sheller; and pad-batch dyeing of plant fibres.

Publications: newsletter, 'Tropical Stored Products Information'; 'Tropical Storage Abstracts', and 'Rural Technology Guides' (so far on hand maize sheller, 8pp, £1.05, and pad-batch dyeing, 54pp, £2.65,both including postage): In preparation, 'Mixing insecticidal dust with grain', and 'Groundnut sheller feeder device'; plus many technical reports - list available. (RT Guides available free to public bodies in countries receiving British aid).

Comments: TPI has a very wide range of activities, of which the above small-scale technologies represent only a small part.

6.1 Brace Research Institute,
McDonald College,
McGill University,
Ste.Anne de Bellevue,
Quebec HOA ICO,
Canada.

Functions: R & D; Evaluation; Promotion; Information.

Programme: established in 1961 Brace has a particular interest in water desalination, irrigation and renewable enery resources. Work has included windmills for pumping and for electricity generation, solar heaters, solar crop dryers, solar distillation, and greenhouse development. With the Canadian Hunger Foundation produced the 'Handbook on Appropriate Technology', 150 pages of drawings, instructions, addresses etc.

Publications: 'How-to-do-it' booklets, on topics including solar steam cooker, solar still, solar water-heater, cheap wind machine for pumping water, solar cabinet crop dryer; the 'Handbook on AT' is available from Canadian Hunger Foundation (see next entry); publication list.

Comments: one of the foremost academic institutions in the Commonwealth working on AT.

6.2 Canadian Hunger Foundation,
75 Spark's Street,
Ottawa,
Ontario, KIP 545,
Canada.

Programme: voluntary organisation with wide range of development activities, with special attention to food production, preservation and processing, and long interest in AT approaches. With the Brace Research Institute produced 'Handbook on Appropriate Technology', which is available from CHF.

6.3 International Development Research Centre,
P.O. Box 8500,
Ottawa,
Canada.

Programme: IDRC has an extensive programme to support research in developing countries. It has helped a Korean University to set up a Regional Adaptive Technology Centre, which will use the facilities of this non-metropolitan university to encourage technical change in local production centres. IDRC also supports the TECHNONET programme (see Entry 20.1). It has an extensive publications list, including reports on Food and Post-Harvest technologies.

6.4 National Research Council of Canada,
National Aeronautical Establishment,
Montreal Rd.,
Ottawa,
Ontario KIA OR6,
CANADA.

Functions: R & D; Evaluation; Production.

Programme: the NRC is now actively engaged in the development of large vertical-axis wind turbines, one of which (rotor diameter 24 metres) is being tested on an island in the Gulf of St. Lawrence. It is also responsible for the expanding government programme to support solar home-heating.

7.1 Institute of Natural Resources,
University of the South Pacific,
P.O. Box 1168,
Suva,
Fiji.

Functions: R & D; Evaluation; Promotion; Consultancy; Information.

Programme: the INR is a regional institute, attached to the university which serves eleven countries of the region; its own staff is supplemented by that of the University. Specific AT activities include a Regional Workshop on Biogas (Methane) and Rural Energy Sources (sponsored by UNESCAP); working displays of renewable energy resources (solar etc.) and installation and evaluation of such sources; study of indigenous medicinal plants; and planned work on the utilisation of ocean energy and on fisheries technology.

Publications: Course and Project Manuals; list available from INR.

Comments: the Centre for Applied Studies in Development, at the University, is thinking of setting-up a low-level technology unit; and will be hosting a regional conference on 'Science and Technology in Development' in 1978.

8.1 Dept. of Agriculture,
The Quadrangle,
Banjul,
The Gambia.

Programme: The Gambia has had an official policy of phased agricultural mechanization since the early 1960's; but after the failure of the approved tool-frame (Aplos) and two small tractors, attention was re-focussed on the Emcot ridger used at the beginning of the programme, on the O.D.2. ridger and on the Unibar toolframe. Delivery of these and spare parts was poor, so in 1973 extensive trials of many models led to the decision to adopt the 'Sine Houe' toolframe, from Senegal, which now forms the basis of the extension 'packages'; it has a single mouldboard plough, a groundnut lifter, 5 weeding tines, a seeder and an earthing-up ridger for cotton.

8.2 Indigenous Enterprises Advisory Scheme,
c/o Ministry of Economic Planning & Industrial Development,
Marina,
Banjul,
The Gambia.

Programme: this is an I.L.O. financed scheme to provide managerial and technical advice to local small-scale entrepreneurs. Labour intensity and appropriate technology have been priorities.

9.1 Forest Products Research Institute,
University P.O. Box 63,
Kumasi,
Ghana.

Programme: part of the Institute's work is devoted to increasing the range of wooden finished products; the Institute has developed an all-wood peristaltic pump, a wooden winnowing fan, an all-wood squeezer to extract water from banana fibre, which is then used for paper pulp; a wooden staple to replace metal strips and rivets in tea-chests; a simple timber testing rig; and preservation techniques for bamboo, for its use as a building material.

9.2 Technology Consultancy Centre,Ghana,
University of Science and Technology,
University Post Office,
Kumasi,
Ghana.

Functions: R & D; Promotion; Consultancy; Information; Production.

Programme: founded in 1972, the TCC provides a link between the technical and scientific expertise of the university, and government agencies, local entrepreneurs and craftsmen. With a staff of 14, the TCC draws on the expertise of about 30 senior university staff, and its work falls into roughly three categories.

1. Technical and commercial advice to businesses and government; on the manufacture of gunpowder, rubber mouldings, wood and coconut charcoal, leather goods, envelopes, sugar, blackboard chalk, sifted kaolin, shoes, tonic drinks, jams and preserves, glues, lost-wax brass casting, glass-bead making, oil-palm cultivation, weaving; chemical analysis of soap, glue, bleach, alcohol, latex fluid, cassava starch, sea shells, caustic soda; repair and maintenance of air-conditioning at major hospitals, design of feeder roads, evaluation of engineering assets of State gold mines, calibration of underground fuel storage tanks, metric calibration of Post Office weights, and a survey of alternative water supplies for a large cotton farm.

2. Development and testing of new products: a pedal-driven rice thresher, premature-baby incubator, traffic lights, pyrolytic converter to produce fuel oil and combustible gas as well as charcoal from charcoal raw material, bullock carts, irrigation pumps, ploughs and cultivators, wood-fired and electric soap and caustic soda plants, driers for cassava, pepper, and spent brewer's grain, screw-press for spent brewer's grain.

3. Production Units attached to the TCC: steel bolts, employing 15 trainees and producing 30,000 bolts for local sale in 1975/76; construction of soap and caustic soda plants, rice-threshers, bullock carts, gate hinges, replacement plough

shares, saw benches, water tanks, hoes, charcoal stoves; weaving unit employing 7 weavers; animal feed from dried brewer's grain, using screw press and solar drying, producing 2 tons per week; and soap pilot-plant, which produced 108,000 bars in 1975/76.

Publications: Quarterly Newsletter, Annual Report, Progress Report on Small-scale soap production.

Comments: an ambitious programme, the lessons of which will be valuable for similar attempts to link university technical expertise with local development needs. With the exception of the soap pilot plant, local entrepreneurs have not so far taken over the actual production units - though demand for their products is high. In the next five years, the TCC will turn increasingly to agriculture and to the rural areas, setting-up two demonstration/training workshops away from the university to train local craftsmen and introduce new products, and two other offices to provide extension advice to small entrepreneurs. They plan to increase the involvement of university staff from 10 to 50 per cent of staff members. Young graduates are being trained as Project Managers, to act as links between the experts in the University and individual business and craftsmen who have sought advice. The Annual Review No. 4 gives both information and self-criticism of the programme.

10.1 Action for Agricultural Renewal in Maharashtra, (AFARM)
3 Victoria Road,
Poona 1,
Maharashtra,
India.

Programme: a technical service agency for a number of development organisations in Maharashtra, AFARM has been particularly involved in the design, development and installation of handpumps; it assisted UNICEF in the development of its latest India Mark II handpump. AFARM also works on irrigation and drilling.

10.2 Action for Food Production, (AFPRO)
Community Centre,
C-17, Safdarjang Development Area,
New Delhi - 110016,
India.

Functions: Information; Consultancy.

Programme: AFPRO is a coordinating and service agency, linking voluntary agencies in India and international donor agencies. It concentrates on increasing the food production of smaller and marginal farmers, its technical staff providing advice, evaluating projects, assisting with the importing of spare parts etc. Its Technical Information Service Department is a clearing house for technical information, answering enquiries, distributing 'AFPRO News Notes' as well as papers and reports on specific technical topics.

10.3 Agricultural Tools Research Centre,
P.O. Box 4,
Suruchi Campus,
Bardoli - 394601,
India.

Functions: R & D; Production; Promotion.

Programme: established in 1959, the Centre has designed and manufactured numerous agricultural tools, including a double hoe with three prongs, seed-bed leveller, furrower, furrow-opener, spade, weeding hoe, bellows-operated insecticide duster, hollow earth auger, hand seed-drill (two-man operated), root puller, (all these are described in detail in the Directory put out by ATDA, India). The Centre has also designed and manufactured a Solar Oven, and is working on a Biogas plant using farm wastes.

Publications: mostly in Gujarati, and some in Hindi.

10.4 Appropriate Technology Cell,
Allahabad Polytechnic,
Allahabad 211002,
Uttar Pradesh,
India.

Functions: R & D; Production; Promotion; Training.

Programme: the Cell is part of the Polytechnic's Village Extension Scheme, but also draws on the facilities of the Production-cum-training centre of the Polytechnic, which has many students plus 400 employees making a wide range of goods. The Cell's work includes R & D of building materials, cheap equipment for filtering water, latrine and soakage pit construction, domestic grinding wheels, ovens, solar energy equipment, handpumps; and agricultural implements (these are produced in quantity by the production Centre, as are Gobar gas plants, threshers and pumps). The Cell has also helped develop manufacturing techniques for cottage industries, such as soap, ink, candles, school chalk, plastic goods and brooms.

Publications: Report of an all-India seminar on Transfer of Appropriate Technology, 1977; monthly 'Polytechnic Resource Letter' carries occasional articles on AT.

10.5 Appropriate Technology Development Association,
P.O. Box 311,
Ghandi Bhawan,
Lucknow -226001,
Uttar Pradesh,
India.

Functions: Promotion; Information; R & D; Evaluation.

Programme: founded in 1972, ATDA was reorganised in 1976. It conducts, on its own and in collaboration with other institutions, a variety of studies, pilot projects and seminars, e.g. surveys and analytical studies of rice-milling technology, flaying and tanning of hides and skins and carcass utilisation, and of forestry. Pilot projects on spinning technology for handloom industry, and on mini-cement plants. R & D work on solar cookers, and on microbiology of biogas (methane) technology. Provides specifications and advice on mini-sugar technology, small-scale pottery and biogas plants. Runs seminars on solar cookers and home appliances, and training programmes on 48-spindle ring-frame (at Ghazipur), and on small-engine maintenance, electric motors, tractors, pumps and threshers (at Alahabad Polytechnic). It has also worked on seed drills, soil-testing kits, cycle rickshaws, solar collectors, wind-mill pumps, and a casuarina oil expeller.

Publications: 'Directory of Machines, Tools, Plant, Equipment, Processes and Industries', a 280-page guide to over 100 A.T. implements and processes, with drawings, text, and addresses of agencies which developed them; price $10 plus $7 postage overseas. 'Case-studies' and 'Project reports' on mini-sugar technology, decentralised pottery production, home living technologies, the rice-milling industry (survey), inbuilt spinning technology.

Comments: One of the main centres for information on AT work in India; their Directory is a mine of information.

10.6 Appropriate Technology Unit,
Department of Industrial Development,
Ministry of Industry,
Udyog Bhavan,
New Delhi 110011,
India.

Functions: R & D; Evaluation; Promotion; Information.

Programme: the ATU is a government body, set up in 1971 to be a centre for AT, and to coordinate national activities. It farms out R & D (and some evaluation) to established institutions. So far it has published reports on tanning, white-ware ceramics, house and road construction, small-scale cement plants (vertical shaft kiln type), methanol plants and dairy plants, agricultural implements and methane (biogas) plants. It is currently overseeing prototype production of a single-row manual seed-with-fertilizer drill, a three-row bullock-drawn plough attachment, and a three-row multi-grain drill. Since March 1977 its areas of interests have widened considerably.

Publication: reports mentioned above.

Comments: the ATU has a very wide brief, including the popularisation of the concept of AT at all levels of society.

10.7 Appropriate Technology Unit,
Indian Institute of Technology,
Powai,
Bombay 400076,
India.

Functions: R & D; Evaluation; Promotion; Information.

Programme: the ATU was set up in 1974, and has contacted field agencies to determine AT needs, collected literature, organised lectures, and has designed and fabricated the following equipment: citronella oil extraction plant, 5 H.P. diesel engine run on 80% Gobar gas, savonius windmill, reciprocating wind machine, aluminium tag-making machine, cathodic polarisation of organic waste to improve quality of biogas, use of flyash in concrete, rice-paddy dryer, pedal-operated cotton heald maker, domestic solar water heater. Designs have been done for a solar engine, sugar cane crusher, sewage treatment plants, groundnut crusher to produce synthetic milk, and a saw for cutting submerged trees.

A collection of AT literature has been established.

Publications: Annual reports give details of projects, many of which have been written-up in internal documents.

Comments: The unit is a loose group of faculty members, with no full-time workers at present. Undergraduates are encouraged to work on AT, and AT is being incorporated into the curriculum. The ATU is trying to work more closely with rural development agencies, to make its research topics more relevant and to get its results translated into action.

10.8 Cell for the Application of Science and Technology to Rural Areas,
ASTRA,
Indian Institute of Science,
Bangalore 560 012,
India.

Functions: R & D; Evaluation; Promotion; Information.

Programme: ASTRA was set up in 1974, and its small staff draw upon faculty and postgraduate students. It has been primarily concerned with R & D, but now a village extension centre is being established at Ungra, 115 kms from Bangalore. Work has been done on a Savonius sail midmill, bullock-carts, bicycles, low-cost teaching materials, biogas plants, small-scale lime pozzolana cement plants, sodium silicate from rice husks, solar air-conditioning. A manual water-pump, designed after analysis of previous pumps' failures, is now in operation throughout the State.

Publications: Annual Report

Comments: One of the first attempts to involve a leading academic scientific institution in AT, ASTRA is founded on the belief that AT needs the same high professional standards in R & D as advanced technologies. It has received some £60,000 in grants.

10.9 Central Arid Zone Research Institute,
Jodhpur,
Rajasthan,
INDIA.

Programme: staff at the Centre have designed, built and tested extensively (daily for 3 years) a simple solar water heater (cost about Rs.450); a low-cost simple solar cabinet drier, capable of dehydrating dates, grapes etc in 2-4 days, has been developed and tested; five types of solar cooker built and tested; four solar water stills built and tested satisfactorily, and a pilot still with a capacity of 100 literes per day has been installed at a nearby school; and types of solar pump are under investigation.

10.10 Centre for Environmental Studies,
3 rue Dupuy,
Auroville,
Pondicherry 605002,
India.

Programme: the Centre has done work on wind and solar power, notably on a solar pump, algae culture farming, fish farming, lime cement and ferro-concrete boats.

10.11 Centre for Science in the Villages,
Magian Sangrahalaya,
Wardha 442001,
India.

Functions: Information; Promotion; Training.

Programme: associated with Khadi and Village Industries, this centre was established in 1976, to provide demonstrations of and training in appropriate technologies which have been tried and tested already. It will disseminate information about AT, from its own documentation centre. So far it has demonstrated the ICRISAT Solar cooker; fungicide and fire-proofing for thatch; a solution of wax, bitumen and kerosene for improving the weathering of mud-walls; a small clay grain silo; use of bamboo for reinforcing concrete; the introduction of soak pits.

10.12 Department of Metallurgical Engineering,
Indian Institute of Technology,
Kanpur 208016,
India.

Programme: this department has designed and tested the manufacture of ASHMOH hydraulic setting cement from rice husk ash. A pilot plant has been set up in Aau, Banda, U.P., with a capacity of 200 tons per year, producing cement at Rs.10 per 50kgs. Research is at present underway on the production of lightweight precast concrete from ASHMOH and rice husk ash (0.8-2.0 gm/cc bulk density at cost of Rs.100/cu.m., needing minimal machinery).

10.13 Forest Products Research Institute,
Dahradum,
Uttar Pradesh,
India.

Programme: has tested and proven a process of using bamboo as a reinforcement for concrete, and a solar-powered timber-drying cabinet.

10.14 GARG Consultants,
c-10/1 River Bank Colony,
Lucknow,
India.

Functions: R & D; Consultancy.

Programme: provides turn-key services for establishment of small scale sugar and cement plants, cottage whiteware pottery, and cottage production of yarn; also specialises in biogas plants and village sewage disposal.

Comments: founded by M.K. Garg, a pioneer of AT in India.

10.15 Gobar Gas Research and Development Centre,
Khadi and Village Industries Commission,
Kora Gramodyog Kendra,
Borivli,
Bombay 92,
India.

Functions: R & D; Evaluation.

Programme: founded in 1962, this is a major centre for Gobar (Methane from wastes) gas R & D, with extensive experience in this technology. Current work is on the reduction of capital costs of Gobar plants; development of community-level plant and of suitable domestic and small industrial gas burners; studies of effect of added urine on fermentation of cattledung, and of heating digester; use of solar energy to increase rate of gassification; development of gas meter, and of a briquetting device for manure; study of high rate digestion; development of suitable engines using gobar gas.

Publication: Monograph describing work on Gobar gas.

Comments: Khadi and Village Industries Commission are big producers of gas plants in India (over 6000 produced between 1962 and 1972); this Centre thus has extensive production experience on which to base its R & D work.

10.16 Grain Storage Research Centre,
Indian Grain Storage Institue,
Hapur,
Uttar Pradesh,
India.

Programme: the Centre's wide range of research into problems of grain storage includes some significant work on AT approaches, especially in the Engineering Division. It tests and publishes designs and offers advice and training.

10.17 Indian Institute of Technology,
Kharagpur,
West Bengal,
India.

Functions: R & D; Evaluation; Information; Consultancy; Training.

Programme: the Department of Architecture and Regional Planning does research on building materials and techniques, and design work on warehouses, cold stores, housing (notably kitchens) and storage bins using local materials. The Department of Geology and Geophysics has designed indigenous equipment for the selection of well-sites and also advises villagers and extension workers on the selection of sites for tube-wells and open-dug wells. The Rice Processing Engineering Centre has done research on parboiling techniques, milling processes aeration of stored paddy, evaluation of engineering properties of paddy and rice grains, utilisation of husk for cement,

concrete, insulation boards and glass, as well as economic and physiological studies of rice processing. It designs and tests equipment, including a farm batch dryer, recirculating batch dryer, LSU batch dryer, rice polish meter, bran stabiliser, kerosene oil burner, laboratory type dockage tester, concrete parboiling tanks, husk-fired furnace, mini-rice mill, and has evaluated the use of solar energy for par-boiling and drying rice, village storage structures, moisture meter calibration techniques, and commercially produced rice processing machinery (Kisan, Dandekar and Qualitex). The Centre also runs short courses for mill engineers, managers and operators, which are open to foreign participants; and provides consultancy services to public and private bodies.

Publications: reports, especially on rice processing equipment and trials.

10.18 International Crops Research Institute for the Semi-Arid Tropics,
(ICRISAT),
1-11-256, Begumpet,
Hyderabad 500 006,
Andra Pradesh,
India.

Functions: R & D; Evaluation; Promotion; Information.

Programme: as well as its large programme for developing seeds and practices for the semi-arid tropics, ICRISAT has a Farming Systems Programme which, since 1975, has been using only animal-drawn equipment. They have tested and adapted two multi-purpose toolbars (Kenmore and Nolle), and fitted to these an improved ridger, scraper, seed-cum-fertilizer drill, a weeder, a relay planter, and two-row cultivation attachments, and a small water tanker. Current work includes the study of Ultra-low-volume sprayers, crop dryers (solar and methane fuelled), and the storage and subsequent pumping for irrigation of surface run-off water.

Publications: Annual report; 'Farm machinery program at ICRISAT'; 'Informal report of the farming systems research program 1975-76'.

Comments: ICRISAT is one of the group of international institutes which includes CIMMYT (Maize and wheat) in Mexico and IRRI (rice) in the Phillippines.

10.19 Murugappa Chettiar Research Centre,
Tiam House,
11/12, North Beach Road,
Madras 600 001,
India.

Programme: the Centre has published a monograph on the use of algal cultures for the production of bio-fertilisers and gas, and has fabricated prototype solar cookers and dryers.

10.20 Saghan Kshetra Vikas Samiti,
Sewapuri,
Varanasi,
Uttar Pradesh,
India.

Function: Production.

Programme: this agency is involved in employment creation through small-scale industries, as well as literacy and health education programmes etc. It uses technologies developed by other Indian AT agencies, notably in its red and white clay pottery industry, using improved furnaces and potters' wheels; manufacture of roofing tiles and underground pipes from clay; of matches, of Gobar gas plants, and of agricultural implements such as harrows, winnowers, ploughs and threshers, of soap from non-edible oils, and of blankets.

10.21 Shahdol Appropriate Technology Unit,
Vidushak Karkhana,
Anuppur,
District Shahdol,
MP 484 224,
India.

Programme: this group, which only supports technologies which contribute to social and economic equality, does repairs and maintenance of agricultural and small industrial equipment; is constructing a manufacturing workshop; and is designing prototypes of bullock-carts, seed drills, mobile pump-sets, rice-husk-ash cement units, and bone grinders. It is doing laboratory work on the solvent extraction of oil from oil-seeds.

10.22 Small Industry Extension Training Institute,
Yousufguda,
Hyderabad 500045,
India.

Functions: R & D; Evaluation; Promotion; Information; Training; Consultancy.

Programme: the Institute, founded in 1962, runs training programmes (45 in 1977) for government officials and employees of relatively large companies, banks etc., who are involved in the development of small industries - 'small' as opposed to both 'large' and 'village' industries. Longer courses for

similar people from overseas are offered. Main AT component of work is in the 'Appropriate Technology Documentation Bulletin', a bi-monthly digest describing about 25 processes or implements,culled from scanning 600 journals and reports at the Small Enterprises National Documentation Centre (SENDOC), attached to SIETI; typical entries range from solar water heater, ferrocement methane biogas holder, to a coffee-de-caffeinating plant costing $50,000, and a new process for making foam aluminium blocks.

Publication: 'AT Documentation Bulletin', 'SENDOC Industry and Technology Bulletin', describing new products and processes suitable for commercial exploitation; 'SENDOC Economics and Development Bulletin', digest of latest information plus reviews of current literature; 'SENDOC Management and Behavioural Sciences Bulletin', (monthly - $20 per year); 'SENDOC Chronicle' a digest of 20 leading newspapers' and 12 weeklies' articles on industry, development, technology, management etc.(fortnightly- $25 per year); 'Index to Product Profiles' giving 1845 product profiles plus further information on them ($12 per copy).

Comments: very wide range of work, with stress on commercial exploitation of products and processes, and strong management/ entrepreneurship element as well as purely technical aspects of development of small industries. 'Appropriate technology' defined as use of indigenous materials, or import substituting, or export-potential, or low-cost, labour-intensive.

10.23 Vigyan Shiksha Kendra,
Attara,
Banda 210201,
India.

Functions: Promotion; Training.

Programme: founded in 1973, this agency seeks to promote the transfer to the rural areas of already developed appropriate technologies; to change the school science curriculum to make it more relevant to rural needs; to expose university staff to the needs of the village, and to train village youth in appropriate techniques. So far it has developed a new science curriculum; set up an ASHMOH pilot and demonstration plant to make cement from rice husk ash (and sold the product successfully); and set up a demonstration gobar gas plant. Its plans include paper-making, soap manufacture, small-scale fertilizer plant using cattle bones, and the farming and processing of medicinal plants.

10.24 Village Reconstruction Organisation,
6/9, Brodipet,
Guntur - 522002,
A.P.,
India.

Programme: a rural community development organisation, VRO has considerable experience in really low-cost housing, particularly in areas affected by natural disasters. It is now setting-up, in cooperation with TOOL, an AT Workshop at Kakani, which

will train local craftsmen, and a production unit for roofing and insulation materials.

10.25 Water Development Section,
P. O. Vadala Mission,
Tal. Newasa District,
Maharashtra,
India.

Programme: has produced unique hand-pumps, made from sheet steel cut and welded. The State government has adopted this design for its drinking-water boreholes.

11.1 Agricultural Machinery Coordinating Office,
East African Agriculture & Forestry Research Organisation,
P.O. Box 30148,
Nairobi,
Kenya.

Functions: Promotion; Information.

Programme: this office disseminates information about, and promotes the use of, AT and other agricultural equipment in East Africa.

Publication: 'Low-cost rural equipment suitable for manufacture in East Africa'; brief descriptions, photographs and technical drawings of 23 items, including Kabanyolo Ox toolframe with attachments, inter-row cultivator, mechanical dibbler, ox carts, bicycle trailer, wheelbarrow, Machakos water cart, groundnut sheller, Morogoro hand maize sheller, Machakos maize sheller, flap valve water pump, IRRI bellows pump, evaporative charcoal cooler, solar heater/drier, storage crib, feed mixer, seed dressing drum, murram block ram, pit latrine or post hole auger, bellows forge, rural anvil, and hydralulic metal bender.

Comment: since the demise of the East African Community, the precise status of EAAFRO is unclear.

11.2 Bungoma Farm Training Centre,
P.O. Box 46,
Bungoma,
Western Province,
Kenya.

Functions: Evaluation; Promotion; Training.

Programme: formerly at Bukura, the centre has specialised in the management of oxen and ox-drawn implements, evaluating different harnesses such as the Indian nose-ring system. It is a significant attempt to tackle the 'software' aspect of appropriate technologies. A Village Technology Unit (see 11.9 below) has recently been set up at Bungoma FTC.

11.3 Department of Agricultural Engineering,
University of Nairobi,
P.O. Box 30197,
Nairobi,
Kenya.

Functions: R & D; Evaluation.

Programme: a special Appropriate Technology Unit was established in the department in 1975, and this has tested ox-drawn equipment from several countries, including a Tanzanian plough, the Agrimal plough and Indian harrow; equipment tested and evaluated includes hand dibblers, Mali planters, Agrimal planter, Kabanyolo tool frame with attachments, and cultivators. The Department plans a research project on equipment needed in semi-arid areas.

11.4 Department of Mechanical Engineering,
University of Nairobi,
P.O. Box 30197,
Nairobi,
Kenya.

Programme: no specific unit devoted to AT, but staff members have been involved in the design, production and testing of two types of windmill for pumping water. One uses modern Cretan Sails, the other metal aerofoil blades. Eight Cretan-type mills have been made. A Savonius windmill has also been built. Associated pumps of cylinder and diaphragm type being developed. A manual maize-sheller has also been developed.

Comments: discussions have been held with UNIDO about a possible technical consultancy service to be attached to the Faculty of Engineering, which would include an AT component.

11.5 East African Industrial Research Organisation,
P.O. Box 30650,
Nairobi,
Kenya.

Functions: R & D; Evaluation; Information; Consultancy.

Programme: with a technical staff of twenty, the EAIRO provides technical advice to entrepreneurs, does chemical analysis for testing and quality control, and applied research on food processing, ceramics and clay technology, and on natural fibres. It has developed a sorghum thresher and a coffee huller.

Publications: Annual Report.

Comments: EAIRO is part of the East African Community, the future of which is now uncertain.

11.6 Farm Machinery Testing Unit,
Ministry of Agriculture,
Nakuru,
Kenya.

Functions: Evaluation.

Programme: the unit has recently started testing small-scale and ox-drawn equipment, and plans to expand this activity. It has evaluated two types of 'walking tractor', maize shellers, mould-board ploughs and a sprayer.

11.7 National Christian Council of Kenya,
P.O. Box 45009,
Nairobi,
Kenya.

Functions: Promotion; Information.

Programme: the NCCK established an 'Ad Hoc Committee on Rural Mechanization' in 1974, which has members drawn from various bodies in Kenya interested in AT, especially in ox-drawn implements and ox-training. It organised a large seminar on rural mechanization, in 1975, and coordinated the import of machinery from abroad and the local manufacture of prototypes for testing in Kenya; the committee is a loosely structured body. The NCCK itself has also supported a programme for the development of windmills along the Tana and Daua rivers.

11.8 Product Development Centre,
Kenya Industrial Estates,
P.O. Box 272,
Machakos,
Kenya.

Functions: R & D; Evaluation; Promotion; Training.

Programme: the PDC is one of the Rural Industrial Development Centres, which provide training for artisans and craftsmen, who can rent workshop space at the centres for their own enterprises. They also receive managerial and technical advice. The PDC has done work as part of this national programme, on ox-carts, threshing equipment and windmill pumps.

11.9 Village Technology Unit,
c/o UNICEF,
Box 44145,
Nairobi,
Kenya.

Functions: R & D; Evaluation; Promotion; Information; Training.

Programme: the VTU has a staff of 3 engineers plus local artisans. It concentrates on housing, sanitation, water supplies, food production and processing, and energy use (human and fuel). It propagates the idea of AT amongst national and community leaders; trains Kenyan Village Polytechnic instructors, and artisans from Kenya and elsewhere, in the construction and use of AT equipment; has helped to set up VTUs at Bungoma, Siakago and at Homa Bay in Kenya; provides an extension service on AT to any project - e.g. the improvement of traditional granaries in Uganda, a water supply for Kapenguria in Kenya; develops, adapts and tests equipment, and does acceptance trials in villages; and exhibits over 50 items of AT hardware at its Nairobi base, including a foot-vice, an oil drum forge, solar steam cooker and solar water heater, charcoal cooler, improved stoves and ovens, crop storage bins, windmills, water pumps, food smoker, cement jars, hydraulic ram pumps, sheller for groundnuts and dried legumes.

Publications: 'Village Technology in East Africa', a report of a seminar, available also from ITDG, London; Village Technology Wallsheet; manual on 'Solar drying of crops in humid climates'; technical specifications for many AT items.

Comments: the Kenyan VTU is at present the focus for UNICEF's regional AT programme, and VTU's are planned for Swaziland, Lesotho and Ethiopia among other countries. When these are established the Kenyan VTU will become a national centre. (See also entry No. 11.10).

11.10 Village Technology Unit,
c/o Youth Development Programme,
Department of Social Services,
Ministry of Housing and Social Services,
P.O. Box 30276,
Nairobi,
Kenya.

Programme: this unit is the same VTU described under 11.9; it is operated jointly at present by UNICEF and the Government of Kenya, but when UNICEF completes its work, it will be run by this Ministry.

12.1 Basotho Enterprises Development Corporation, (BEDCO)
P.O. Box 1216,
Maseru,
Lesotho.

Programme: BEDCO is the small industry side of the Lesotho National Development Corporation, providing credit, technical and managerial advice etc; it is proposed to have an AT 'desk' at BEDCO.

12.2 Thaba-Khupa Farm Institute,
Thaba-Khupa Ecumenical Centre,
P.O. Box 929,
Maseru,
Lesotho.

Programme: this farm-training institute plans to establish an intermediate technology unit which will evaluate and adapt agricultural equipment, provide blue-prints and train local craftsmen in their manufacture.

13.1 Farm Machinery Testing Unit,
Agricultural Research Station,
Chitedze,
P.O. Box 158,
Lilongwe,
Malawi.

Functions: R & D; Evaluation; Information; Production.

Programme: the Chitedze 'Ridgemaster' tool-bar is produced commercially by the ARS from its own design; a groundnut lifter (notable for its reversible single wheel), maize-sheller, and a groundnut cracker for confectionery preparation, have been designed and built as prototypes. Evaluation reports have been prepared on a simple and effective milk cooler, the Tinkabi tractor, planters, seeders, a ridger-weeder and a four-row rice planter.

13.2 The Polytechnic,
Private Bag 303,
Chichiri,
Blantyre,
Malawi.

Programme: the Polytechnic is to be the location of a new Technology Development Unit, to be set up by the Government. This will concentrate in particular on alternative energy sources, as well as covering other AT topics. At the Polytechnic itself, student projects and staff seminars on AT have been organised, and three working groups set up to plan work on low-cost housing, alternative energy sources and village water technology.

14.1 Malaysian Agricultural Research and Development Institute, (MARDI),
Locked Bag No. 20,
Post Office, University of Agriculture,
Serdang,
Selangor,
Malaysia.

Programme: wide range of R & D activities on all aspects of agriculture; a special unit deals with the economic aspects of products and processes developed by the Institute, and the transfer to the 'consumers' of technologies of fruit and vegetable processing; meat, fish and poultry processing; fruit and vegetable pickling; fermented foods production; and food packaging. Reported to have done work on sail windmills and on peristaltic pumps.

15.1 School of Industrial Technology,
University of Mauritius,
Reduit,
Mauritius.

Programme: work has been done at the university on reinforcing concrete with bamboo, and with aloe fibre; on methane from cowdung and from bagasse, milk carrying cans, and on solar energy.

16.1 Kristian Institute Technology of Weasisi, (KITOW),
White Sands,
Tanna,
via Vila,
New Hebrides.

Programme: this institute consists of a series of workshops spread around several villages, which are in effect small industries plus training and repair facilities. They are formed into the KITOW Producers Cooperative Association, and manufacture concrete blocks, ferro-cement water tanks, grave stones, pig troughs, furniture, plywood dinghies and workboats, do simple sheet metal work and repair machinery, and run a small sawmill. An abbatoir and refrigerated cold-store are under construction. The whole project is rooted in the ideas of AT.

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(The entry below arrived too late for it to be assigned a separate code-number. Country code 16 includes both New Hebrides and New Zealand).

16.2 Department of Scientific and Industrial Research,
Physics and Engineering Laboratory,
Private Bag,
Lower Hutt,
New Zealand.

Programme: the Department is working on an efficient wood-burner, as part of an investigation of 'energy farming'; work is also being done on the gassification of wood for the production of methanol. A solar water-heater is under development.

17.1 African Rural Storage Centre,
c/o International Institute of Tropical Agriculture,
PMB 5320,
Ibadan,
Nigeria.

Functions: Evaluation; Promotion; Information; Training.

Programme: set up by FAO & DANIDA in 1973, the first phase of this project is now completed, being largely confined to the study of maize storage, (husk and shelled), and concluding that 'traditional on-farm storage systems are fundamentally sound'; research on moisture content and losses due to insects have been conducted, effects on these of crib design and use of insecticides tested, and results/recommendations disseminated to African countries.

Publications: wide range of papers and reports on maize storage, and on natural drying of paddy and of cassava chips.

Comments: work is now being extended to cover other food crops of humid tropics; information disseminated stresses need for farmer participation in evolution of improved systems, and attention to socio-economic aspects of individual area, and is thus confined to fundamental factors in design of storage, rather than blueprints and specific instructions.

17.2 Department of Agricultural Engineering,
University of Ife,
Ile Ife,
Nigeria.

Programme: an AT information Centre has recently been established at the University library. Work on leaf protein has been proceeding at the university for some time.

17.3 Federal Institute of Industrial Research,
PMB 1023,
Murtala Muhammed Airport,
Ikeja,
Lagos State,
Nigeria.

Functions: R & D; Evaluation; Information.

Programme: the Institute has developed and fabricated the 'FIIRO Still' for small-scale distillation of potable spirits from palm-wine; small-scale mechanised gari plant; improved dyeing jig making dyes from vegetable sources; hot-air fish-drying equipment; plant for production of vinegar from fermented palm-wine.

Publications: reports on technical and economic feasibility of

small-scale distillation, and apparatus needed for utilising dyes and tanning from vegetables; inexpensive improvements in village gari-making; pilot production of dried fish.

Comments: plans a workshop to design and manufacture agricultural, machine-tool, food processing and electrical equipment, which will be base of proposed FAO Technology Transfer Centre for five English-speaking countries of West Africa.

17.4 Institute for Agricultural Research,
Ahmadu Bello University,
Samaru,
PMB 1044,
Zaria,
Nigeria.

Functions: R & D; Evaluation; Information.

Programme: Agricultural Mechanization Programme is testing the 'Plantmaster' handplanter, a manual maize-sheller and five commercially-produced groundnut shellers; has developed a manually operated threshing machine for maize, and ones for sorghum, millet and wheat are under development; attachment of weeding knives to the EMCOT toolbar has been developed and tested, as has a bullock-drawn straddle-row weeder. An animal powered transmission unit for stationary machines is under development, as are donkey-drawn implements and water-lifting devices for domestic use. Many studies done of technical/economic costs and benefits of different implements/practices/processes.

Publications: numerous, including over 100 extension guides; list available.

Comments: the IAR has 165 staff members, and is responsible for all agricultural research in northern Nigeria.

17.5 Intermediate Technology Workshop,
P.O. Box 401,
Waff Road,
Zaria,
Kaduna State,
Nigeria.

Programme: the ITW has designed and produced a wide range of cheap hospital equipment, made from local materials with local labour. This range includes an 'A' frame baby's cot, bedside locker and table, ward trolley, hospital and 'bush' wheelchairs, hospital screen, patient's trolley, parallel bars, baby-resuscitation table, child's cot, bicycle ambulance, gas cylinder trolley, invalid carriage (manual bicycle mechanism), casualty bed, neonatal suction pump, supine exerciser, paraplegic turning frame, premature baby incubator, haematocrit centrifuge, hospital water-still, constant temperature bath, transfusion stand, leg traction frame, and a folding bed.

Publications: designs of above, available in a single booklet from Ministry of Trade, Industry and Cooperatives, State Government, Zaria.

17.6 International Institute of Tropical Agriculture,
Agricultural Engineering sub-Programme,
PMB 5320,
Ibadadan,
Nigeria.

Functions: R & D; Evaluation; Information; Consultancy.

Programme: part of the Farming Systems Programme, the object of which is to develop an alternative to the prevailing shifting cultivation practised in lowland humid tropics. They are developing equipment and processes for a minimum tillage programme, suitable for small farmers, with special reference to the reduction of drudgery and to the need for non-animal sources of energy (due to tsetse fly). Equipment developed includes a maize jab-planter, modified landmaster tractor and inter-row sprayer; use of battery-powered herbicide spraying equipment is under study, as is potential of solar photo-voltaic electricity as source of power for U.L.V. herbicide sprayers.

Publication: several research reports, Annual Report.

Comments: the IITA's work is not confined to Nigeria, but is international in scope, and projects are under way in other countries of West Africa; library and documentation centre has been set up.

17.7 Projects Development Agency,
3 Independence Layout,
P.O. Box 609,
Enugu,
Nigeria.

Functions: R & D; Promotion; Consultancy.

Programme: founded in 1970, this government-sponsored agency does R & D and limited production for demonstration purposes and provides technical advice to government, industry and individuals: topics covered include analysis of clays, ores and sands and their development for glassware and ceramics; adaptation of foundry, machining, forging and fabricating processes and production of building moulds, centrifugal air-blowers; development of food-processing equipment such as cassava peeler, grater and de-waterer, garri frying and yam pounding; development of agricultural equipment including small-scale egg-incubator, yam hole-digger, village par-boiler, palm-kernel cracker, mechanical grinder; development of processes for manufacture of school chalk, welding electrodes, pulp from straw, building and fire bricks, ceramic wares; some research work has been done on solar water-heaters, and on smokeless fuels from local coal.

18.1 Liklik Buk Information Centre,
Box 1920,
Lae,
Papua New Guinea.

Functions: Promotion; Information.

Programme: this is a special project of the Melanesian Council of Churches, and has produced 'Liklik Buk', a comprehensive handbook/catalogue on rural development. Articles on crops, fertilizers, animals, simple technology designs and processes, health, are accompanied by lists of useful books and organisations. A new English edition was produced in 1977 and a Melanesia Pidgin edition will be out in 1978. The Centre itself provides further information in answer to readers' requests, and has a small library.

Publications:'Likluk Buk' (see above); available from Wantok Publications, Box 1982, Boroko, PNG; from VITA, 3706 Rhode Island Av., Mt. Rainer, Maryland 20822, USA; and from Third World Publications, 151 Stratford Rd., Birmingham, England.

Comments: The Liklik Buk layout is outstanding, with use of cartoons, photos, different typefaces etc.

18.2 South Pacific Appropriate Technology Foundation,
Office of Village Development,
P.O. Box 6937,
Boroko,
Papua New Guinea.

Functions: R & D; Evaluation; Promotion; Information; Production.

Programme: founded in 1976, SPATF is a regional non-governmental agency. Present staff of six will soon expand to ten. SPATF will have an information and technical extension/consultancy service; it is already preparing booklets on blacksmith's bellows, hydraulic ram pumps and trailer-building. SPATF/Unitech will be an R & D unit located at the University of technology, Lae, PNG, where an engineer has been specially appointed. Village Equipment Supplies is a non-profit trading company attached to SPATF, to import, test, evaluate, adapt and market equipment suitable for village use - it is already testing a sweet potato chipper, manufacturing hydraulic ram pumps and has Cinva rams on order. Provincial AT Demonstration Centres are planned. After satisfactorily establishing itself in PNG, SPATF will assume its regional role.

Comments: SPATF is strongly supported by the Government of PNG, which has given office-space and financial help. It has also received funds from the New Zealand Government, the Commonwealth Fund for Technical Cooperation, and the Dag Hammarskjold Foundation.

18.3 Technology Development Unit,
University of Technology,
P.O. Box 793,
Lae,
Papua New Guinea.

Functions: R & D; Evaluation.

Programme: the Unit is now being set up, and is associated with the South Pacific Appropriate Technology Foundation (which will handle dissemination of findings etc); with VITA (Volunteers in Technical Assistance), whose representative works part-time at the Unit; and with Liklik Buk, whose technical adviser also works part-time at the Unit. The Unit will have its own small staff but will also utilise the members of the University staff. It is currently testing various designs of hydraulic ram pumps; testing a sago processing machine; and developing a cheap pelton wheel for small hydro-electric schemes. The University itself has research projects on small-scale cement production, bicycle assembly, solar refrigeration, wood preservation and small-scale food processing.

Comment: an active group which is involved in a wide range of AT work.

19.1 Centre for Advisory Services in Technology, Research and Development, (ASTRAD)
Department of Engineering,
Fourah Bay College,
University of Sierra Leone,
Freetown,
Sierra Leone.

Functions: R & D; Consultancy; Information.

Programme: since 1973 ASTRAD has provided advice to industry and government on engineering problems of all kinds, including the design and manufacture of agricultural implements, nuts and bolts, and replacement parts for imported machinery. It runs an inventor's club for members of the public with engineering ideas. ASTRAD has developed a palm-oil press, a solar water heater, a palm-nut cracker and electrosene domestic water heater. ASTRAD is conducting its own research on aspects of solar power, and on the use of local fuel supplies and local building materials.

Publications: on windpower (10pp), laterite for earthcrete (34pp) and on a screw-press for palm-oil (20pp).

19.2 Department of Agricultural Engineering,
Njala University College,
Njala,
PMB Freetown,
Sierra Leone.

Programme: prototypes have been designed and built of a wooden rice-thresher, a 'Samao' low-cost crop drier, steam-parboiling machine for rice, groundnut-sheller, and a hydraulic pump using watermill principle.

19.3 Small Farm Equipment Unit,
Tikonko Agricultural Extension Centre,
P.O. Box 142,
Bo,
Sierra Leone.

Functions: R & D; Evaluation; Promotion; Production.

Programme: SFEU produces for sale manually-operated rice-threshers (for long or short straw) and rice winnowers (80-100 bushels /day), rice weeders, 200 lb weighing scales, and wooden pulleys for village wells. A cassava-grater is being developed, and production of simple farm tools which are presently imported is planned for 1977. It is surveying the scope for helping rural blacksmiths.

Publications: Mimeoed promotional and technical information on its equipment.

Comment: Tikonko A.E.C. is especially involved in rice-growing in controlled water swamps. It is run by the Methodist Church.

20.1 Technonet Asia,
International Development Research Centre,
Tanglin P.O. Box 160,
Singapore 10.

Programme: Technonet is a regional agency, financed by the IDRC of Canada, which links together 11 national organisations in nine Asian countries which deal with small and medium industries. It publishes a newsletter, reports and a digest with technical information about products and processes, runs courses for industrial extension officers, provides some financial support and encourages local entrepreneurs. Its object is to share the skills and experience in the region, rather than having to rely on technical inputs from the industrialised countries.

21.1 Appropriate Technology Group,
c/o Chris de Saram,
Chemical Industries (Colombo) Ltd.,
P.O. Box 352,
Colombo 1,
Sri Lanka.

Programme: established in 1975, this is a group of government officials, engineers, academics and private businessmen, with links to ITDG (see entry 5.2) and TOOL (see entry 26.4). The ATG will promote an AT approach, concentrating for now on blacksmithing, small-scale hydro-electric schemes, windmills for irrigation, canal clearance and light engineering. With TOOL the group is examining a solar ice-making unit, and the extraction of drugs from medicinal herbs.

21.2 Sarvodaya Appropriate Technology Development Programme,
Lanka Jatika Sarvodaya Shramadana Sangamaya (Inc),
77 de Soysa Road,
Moratuwa,
Sri Lanka.

Functions: R & D; Promotion; Training.

Programme: Sarvodaya is a large Ghandhian-style self-help community development organisation, which organises training and self-help programmes in many areas of Sri Lanka. The ATDP was set up in 1975, and has so far developed prototype windmill pumps, and done research on soap-making, paper production and the manufacture of clay pipes and tiles. It plans to run training courses in appropriate technologies for village youth.

22.1 National Industrial Development Corporation,
Matsana Industrial Estate,
P.O. Box 50,
Manzini,
Swaziland.

Functions: R & D; Production.

Programme: the 'Tinkabi' tractor has been developed by the NIDC, and some 150 have now been produced and sold. The tractor has a 15 h.p. diesel engine, an hydro-static transmission (forward and reverse gears and brake all operated by one handle), can carry up to 500 kg load and can be fitted for all types of agricultural use. They are being tested in several countries in East and Southern Africa.

22.2 Small Enterprises Development Company Ltd.,
P.O. Box 451,
Mbabane,
Swaziland.

Functions: Promotion.

Programme: with its sister-organisation, the Small Enterprises Promotion Office, SEDCO provides working capital, managerial and technical advice to small industries. So far 90 enterprises have been created, employing 800 people, mostly on industrial estates. Products include textiles, water tanks, scotch carts, clutch plates and brake linings, furniture, fencing, wooden rulers, tanning and tall oil.

23.1 Arusha Appropriate Technology Project,
P.O. Box 764,
Arusha,
Tanzania.

Functions: R & D; Evaluation; Promotion; Information.

Programme: financed by the Swedish government through the Tanzanian Small Industries Development Organisation, AATP was started in 1976. With a staff of 12, it conducts detailed surveys of each area, and extensive discussions with the inhabitants, before proposing technical solutions which are also economically feasible. So far the project has developed a methane (biogas) generator, a water-pumping windmill, a multipurpose pump based on Chinese design, and a machine for the production of stabilised soil construction blocks, all in response to identified needs. AATP also provides information and advice on technical problems to enquirers at its offices.

Comment: this project is particularly notable for its techniques of communicating its ideas to the villagers, and for the attention it pays to this and to feedback from the people. Equipment is built in the village and villagers participate in building, modifying etc.

23.2 Department of Agricultural Mechanization,
Faculty of Agriculture,
University of Dar es Salaam,
P.O. Box 643,
Morogoro,
Tanzania.

Functions: R & D; Evaluation.

Programme: students do regular project work on AT. A range of pedal-powered machines has been developed (threshers, winnowers, water-pumps), four types of windmill built and tested, and one adapted as a grain mill using direct-drive from sail shaft to grinding wheel; a wheelbarrow peristaltic sprayer has been developed to the prototype stage; a plastic-tubing water pump, and cheap and simple bearings have also been developed.

23.3 Department of Electrical Engineering,
University of Dar es Salaam,
P.O. Box 24121,
Dar es Salaam,
Tanzania.

Programme: the department has done some work on rural electrification using windmills and a paper is available summarising options, designs, theory etc.

23.4 Kilacha Production and Training Centre,
Box 21,
Himo,
Tanzania.

Programme: the Centre has developed poultry feeders and waterers, and most notably a simple kerosene-heated incubator, with a capacity of 100 to 1000 eggs; 20 of these were produced for sale in 1976, and less than 10 per cent of their sale value is made up of imported components.

23.5 Tanzania Agricultural Machinery Testing Unit, (TAMTU)
P.O. Box 1389,
Arusha,
Tanzania.

Functions: R & D, Evaluation; Information; Production.

Programme: TAMTU was founded in 1955, and designs and manufactures a wide range of animal-drawn equipment and simple implements, as well as testing those made elsewhere. Six regional workshops as well as TAMTU itself produce carts, harrows, planters, weeders, winnowers and axles and wheels. A separate section of TAMTU designs more basic implements such as wheelbarrows, handcarts, seed-dressers, maize-shellers, vices, hand-planters, and its extension workers assist village craftsmen in their manufacture.

Publications: Many evaluation reports on equipment tested; also sponsored 'First steps in village mechanization', by G. McPherson 1975.

Comments: production is only an interim measure because no commercial manufacturer has taken on this task. More regional workshops are planned. TAMTU is currently looking for a new site, as it is difficult to visit at present.

23.6 Small Industries Development Organisation,
P.O. Box 2476,
Dar es Salaam,
Tanzania.

Functions: Promotion; Information; Evaluation; Training.

Programme: SIDO was established in 1973, replacing the National Small Industries Corporation, and is charged with all aspects of the promotion of small industries - feasibility studies, technical and managerial advice, provision of credit, marketing, training. It has twenty regional Small Industry Promotion Offices. By April 1976 it had prepared 40 feasibility studies; in the year 1976/77 SIDO is spending Shs. 30 million on its work, and will be training 400 students in pottery, oil-extraction, fruit and vegetable preservation

and charcoal making. SIDO is involved in work on bricks and tiles, lime, pozzalana and lime blocks, burnt clay bricks, portland cement, ceramics, glass, wool spinning and weaving, milling and threshing and winnowing, meat processing, fish drying and packing, the utilisation of food wastes, brushes made from coconut fibre, methane gas, fertilisers and salt. SIDO is also experimenting with a cupola foundry, windmills and forge blowers.

23.7 Ubungo Farm Implements,
P.O. Box 20126,
Dar es Salaam,
Tanzania.

Functions: R & D; Evaluation; Production.

Programme: basically a factory, turning out large numbers of hoes and single-furrow mould-board, ox-drawn ploughs, for sale throughout Tanzania. Established with Chinese assistance, Ubungo is a Tanzanian corporation, and is independent of the government. Active R & D and Evaluation section tests and develops a wide range of ox-drawn equipment.

23.8 Uyole Agricultural Centre,
P.O. Box 400,
Mbeya,
Tanzania.

Programme: recently established with support from NORDIC aid, the centre is involved in dry-land minimum tillage research. It has a mechanisation section, which has constructed a Village Technology Workshop, and has developed a prototype of a wooden tool-carrier, with an attached 'Universal Jembe' (tine); and a 4-wheel ox-cart. Particular interest in improvement of draught power from oxen, through improved feeding, health, and improved draught mechanisms.

24.1 Department of Agricultural Engineering,
Makerere University,
P.O. Box 7062,
Kampala,
Uganda.

Programme: due to shortage of spare parts for imported machinery, the department has been investigating AT approaches more fully; design of a Mark V Kabanyolo tractor (14 HP and 3 speed mechanical gearbox) has been carried out, and improvements to ox-drawn equipment are being done after a study of animal ergonomics ; cement block-making machines and mixing ratios tested; a solar crop dryer has been produced and is being modified.

25.1 Farm Machinery Research Unit,
Regional Research Station,
P.O. Box 11,
Magoye,
Zambia.

Functions: R & D; Promotion; Training; Production.

Programme: associated with a survey programme to determine farmers' needs, the FMRU also trains artisans in the manufacture of the equipment it has devised. This equipment includes a forge made from an oil-drum, with foot-operated bellows made from wood, canvas and polythene;a five-tined inter-row cultivator; a groundnut lifter based on the Emcot ridger; a weeder based on Emcot; a metal-bending jig, and an ox cart.

Publications: detailed plans of some of the above are available on request.

25.2 Intermediate Technology Workshop,
Family Farms Ltd.,
P.O. Box 42,
Magoye,
Zambia.

Functions: R & D; Promotion; Information; Production.

Programme: Family Farms Ltd., provide a package deal of credit, training and extension advice to farmers on new settlements. In 1973 they started an AT workshop, to make, and to train the farmers and others such as blacksmiths to make simple equipment and to do repairs. It now manufactures chisels and punches for metal; axes and adzes; blacksmiths' tongs and vices; cutting and stocking implements for harvesting; winnowing equipment; sunflower threshers; water pumps (including pedal operated); ox and bicycle carts; oil soaked wooden bearings; a sorghum syrup extractor, and a solar cooker and solar water heater.

Publications: newsletter.

25.3 JETS of Zambia,
School of Engineering,
University of Zambia,
P.O. Box 2379,
Lusaka,
Zambia.

Functions: R & D; Promotion; Training.

Programme: JETS is a national science and technology club for young people, which aims to encourage the learning and application of these topics in Zambia. It has produced a twenty-page booklet of technical drawings for the production of pipette racks, test-tube stands, test-tube racks, lens racks, tripod stands, retort stands, burette stands, clamps, clamp-holders, a wave-motion demonstrator and a stevenson screen. All designs have been tested by JETS.

Publications: booklet and magazine 'JETS of Zambia', circulation 3000.

25.4 Technology Development and Advisory Unit,
University of Zambia,
P.O. Box 2379,
Lusaka,
Zambia.

Functions: R & D; Evaluation; Consultancy; Production.

Programme: TDAU was set up in 1975, to be a technical consultancy service to government and to large and small businesses, and to develop new products and processes suitable for Zambia. Brick-making machines have been built and sold, and soil cement blocks tested for high temperature use; a cashewnut processing plant has been built and is now in operation with the Department of Agriculture; an inter-row cultivator has been re-designed and tested; and a machine for making bed chains has been developed; a cyclone groundnut sheller has been developed; a Tinkabi tractor from Swaziland has been modified and tested; knapsack sprayers tested; an hydraulic ram using local materials and operating from a small head has been developed. Technical analyses have been done for the Civil Aviation Authority; a ballistic tube for fire-arm testing has been produced for the police; tests on cattle-cake have been conducted, and advice on its processing given.

Comments: TDAU has faced some staffing problems during recent months.

In this section are summaries of the activities of some international organisations which, because of their size or their specific expertise, are included in this directory although they are not necessarily associated with the Commonwealth. Three international organisations which are located in Commonwealth countries will be found under the entry for that country - these are the International Development Research Centre (Canada), the International Crops Research Institute for the Semi-Arid Tropics (India) and the International Institute of Tropical Agriculture (Nigeria).

26.1 Commonwealth Secretariat,
Marlborough House,
Pall Mall,
London SW1Y 5HX.
England.

Programme: three functional divisions of the Secretariat are working on aspects of Appropriate Technology. The Food Production and Rural Development Division, which has prepared this directory, held a meeting on Rural Technology, in Tanzania in September 1977, and is preparing a report on the meeting, together with a catalogue of the equipment exhibited. Similar meetings are planned for other regions of the Commonwealth. This division has also engaged in work on post-harvest losses, in cooperation with the Commonwealth Science Council. The Council held conferences on Alternative Energy Sources, in Sri Lanka in 1976 and in the Bahamas in 1977. It is also organising a series of regional conferences on Communications Techniques in Science and Technology, and a meeting in Bangladesh, in January 1978, on Rural Technology, in co-operation with the FRD Division. The Education Division has sponsored meetings on the local production of educational materials and teaching aids, and published 'The Production of School Science Equipment' (Price £1.25). A workshop on this topic was held in the Bahamas in 1976, and two further regional workshops are planned.

26.2 Food and Agriculture Organisation,
Via delle Terme di Caracalla,
00100 Rome,
Italy.

Programme: FAO's work covers the whole spectrum of agricultural development, and it publishes a range of useful papers, reports etc., on specific aspects of it. Among those most relevant to this Directory are 'Farm Implements for Arid and Tropical Regions' (160pp, many drawings); 'Agricultural Machinery Workshops; design, equipment and management'; 'The employment of draught animals in agriculture', and the various AGS Bulletins, which include sun-drying of fruit and vegetables, sericulture, rice-milling and tea-processing, among other topics. A list is available from FAO.

26.3 International Labour Office,
CH-1211 Geneva 22,
Switzerland.

Programme: under its World Employment Programme, the ILO has produced a number of academic studies of technological choice in developing countries, comparing the economic and social costs of different technologies, notably of road construction, but also of can-making, use of second-hand machinery, shoe manufacture, irrigation. With UNIDO the ILO is to publish technical memoranda on specific industries. The ILO is also to provide technical assistance to set up regional and national centres for research and policy on choice of technology.

26.4 Technische Ontwikkeling Ontwikkelingslanden, (TOOL)
Maurittskade 61a,
Amsterdam,
Netherlands.

Functions: R & D; Information; Promotion.

Programme: in 1974 nine Dutch groups working on AT set up TOOL, which has a small secretariat itself. Requests for advice and information can be sent to TOOL, which both checks its own store of documents, and contacts one of its volunteer groups, who assign a qualified volunteer to answer the query. Several hundred such requests are handled each year, on agricultural techniques and tools, plant protection, veterinary problems; small-scale irrigation; soil-sampling; waterpumps, water purification, well-digging; wind, solar, hydraulic and biogas power; small bridges and dams; housing; dispensaries; manufacture of paper, soap, glasses, tools; nutrition, medical equipment; cooperative management.

Publications: a series of 'How to...' manuals (some in English); manuals for construction of grain silo ($1), salawepump ($1.25) shallow wells ($7), soap preparation ($1), annotated windmill bibligraphy ($10), winnower ($2); 'Wind and Sun Compendium', a quarterly on wind and solar power.

Comments: TOOL is largely supported by the Dutch Government. It is preparing a classification system for AT information and terminology.

26.5 United Nations Children's Fund, (UNICEF)
866, United Nations Plaza,
New York,
NY 10017,
U.S.A.

Programme: as well as supporting the Village Technology Units (see entry 11.9), UNICEF's general programmes have a notable AT component, with a particular concentration on small-scale food processing, hand-dug wells, manual water pumps, and the provision of cheap, local health care. UNICEF has active regional offices throughout the world; the development of the India Mark-II handpump for deep tube-wells had a large UNICEF input (and provides a classic case-study of the development, by trial and error, of an 'appropriate' piece of technology).

26.6 United Nations Economic Commission for Africa,
Africa Hall,
P.O. Box 3001,
Addis Ababa,
Ethiopia.

Programme: an AT specialist is working at the African Training and Research Centre for Women, which is part of the UNECA.

26.7 United Nations Industrial Development Organisation,
Lerchenfelder Strasse 1,
A-1070 Vienna,
Austria.

Programme: UNIDO runs a technical enquiry, information and referral service which provides details of small-scale processes likely to be suitable for developing countries. It is planning to produce a directory on appropriate technology with emphasis on industrial technologies.

26.8 Volunteers in Asia,
P.O. Box 4543,
Stanford,
California,
U.S.A.

Programme: has recently produced 'Appropriate Technology Sourcebook', which indicates where to get information on almost all AT topics; lists 375 names and addresses, and prices of items ($5.00 plus postage).

26.9 Volunteers in Technical Assistance, (VITA)
3706, Rhode Island Avenue,
Mt. Rainier,
Maryland 20822,
U.S.A.

Programme: VITA draws on volunteers who can go overseas, volunteer advisers in the USA, and its large library to answer technical queries on all aspects of A.T. In all it has some 4,500 people with technical expertise 'on tap'. It cooperates closely with organisations in developing countries, and is involved in setting-up AT centres in Papua New Guinea and Botswana, among other places. With ITDG (See 5.2), it is probably the major source of information on AT equipment and processes. It publishes 'Village Technology Handbook', 350 pages of detail about a wide variety of technologies; and also

manuals on specific topics, including automotive repair and maintenance, bat control, fish-smoking and salting, cinva-ram blockmaking, construction of small dams, water turbines and waterwheels, solar cooker, fired clay bricks, school chalk, playground equipment, groundnut sheller (animal or machine powered), hydraulic ram pump, small airstrips, windmills, health records system, plaster of paris bandages, natural water-proofing substances, handpumps, furniture, small-scale grain storage, fish-pond culture and management, hand-dug and tube-wells, water tanks and purification, reforestation, handlooms, rabbit raising and many other topics.

26.10 World Health Organisation,
Appropriate Technology for Health Programme,
Avenue Appia,
1211 Geneva 27,
Switzerland.

Programme: this programme started in 1976, and 1977 is earmarked for planning and preparation of a six-year plan of action. The ATHP is closely associated with AHRTAG (see entry 5.1), and is preparing a list of problems; a census of AT already in use in the health field; an inventory of groups which have a special interest; and a system for collecting and disseminating information. It is planned that WHO will finance R & D contracts for AT health work. WHO has been involved in some other AT work, notably on water pumps.