

ent disciplines to appreciate each other's difficulties. In this way many problems will be seen to be common. For example, says Professor Runcorn, those concerned with convection in the mantle will undoubtedly benefit by dialogue with those working on geophysical fluid dynamics of atmospheres and oceans.

## NUTRITION

### Equation Doesn't Balance

from a Correspondent

DOES the man/food equation balance? Not for long, was the verdict of a two-day symposium held at the Royal Institution, London, recently. The first day was devoted to the problems of feeding an increasing population within the constraints of conventional food production; the current supply of fuel and preservation of the environment.

Averaged over the globe it is easy to be complacent about the rate at which food production is keeping pace with population growth, but several speakers pointed out that such averages serve to mask local inequalities of distribution that are indisputably linked with purchasing power. Professor G. Borgstrom (Michigan State University) explained that with some exceptions most of the major gains, in themselves quite dramatic advances in agriculture, have benefited the satisfied world while the hungry world is growing relatively more hungry. Furthermore, although the growth rate of fisheries has been keeping up with population, this increase has been associated with a lowering of quality, measured by the proportion of the catch converted to animal feeds, where there is an eleven-fold reduction in protein yield (Dr S. J. Holt, International Fisheries Research, Malta). Even this growth of the fisheries is bound to slow down as stocks are overfished—witness the collapse of the anchoveta industry in Peru.

The chairman, Dr A. Bourne (Lancaster University), argued cogently that even now insufficient attention is being paid to environmental balance and that as a result of intensive agriculture, deforestation, urbanisation and pollution, man is being driven into an environmental cul de sac with not enough room to turn. Much of the energy provided by the Aswan dam is used for the manufacture of fertilisers to supplement the fertility of the Nile delta, which it destroyed. Deforestation in China has long resulted in excessive loss of sediment to the ocean. Man is the ultimate predator and even the ocean food he preys on is becoming increasingly polluted by his frenetic and self-imposed industrialisation. Modern intensive agriculture has interfered with the life cycles of nitrogen-fixing organisms and our only means of replacement involves

enormous quantities of energy from fossil fuels. The dangers of emptying the natural reservoirs of indigenous genetic variability are already becoming apparent when we see how narrow is the genetic basis that plant breeders will be able to tap in the future if these centres of variability are destroyed (Dr J. T. Williams, Birmingham University).

On a more personal level, the problems of energy and malnutrition were examined by Professor P. V. Sukhatme (Gokhale Institute, Poona) and Dr E. Wheeler (London School of Hygiene and Tropical Medicine). Protein malnutrition is endemic in India, not because the protein in itself is insufficient, but because the calorie intake is too low to metabolise it. In Bihar, for example, 9% of the population had too little protein in their diet, but 59% had insufficient calories. Equalising the energy purchasing power is the answer to malnutrition here.

It now seems well established that vascular disease and constipation are the price we pay for Western civilisation and the final session of the symposium was devoted to the part played by our degenerate diet. Dr M. Crawford (Nuffield Institute of Comparative Medicine, London Zoo) laid particular stress on the importance of lipids in the diet, especially linoleic and linolenic

acids. In maternal nutrition, these fatty acids may be crucial for the developing brain and nervous system of the foetus. Dr B. Feingold (Kaiser Medical Centre, San Francisco) described some of his successful treatments of children suffering from hyperkinesia and learning difficulty with salicylate free diets, hypothesising food additives as causative agents of this disease.

Finally, Professor D. P. Burkitt (Medical Research Council) and Dr N. Painter (Manor House Hospital) presented evidence for the importance of fibre in the diet. Non-infective bowel diseases, a scourge of the Western world are rarely found in developing countries. Burkitt developed a convincing argument that these diseases are associated with increased pressure in the intestinal lumen and faecal arrest. Cereal fibre, high in hemicelluloses, is lacking and Dr Painter provided the clinical evidence for putting fibre back into the diet. By giving bran, he has had remarkable success in treating patients for diverticular disease.

The drug and food industries and the medical profession might heed Burkitt's analogy with the overflowing sink; too much effort and money is spent on the mopping up operation and not enough on turning the tap off. Synergy, not dominance, is the keynote to survival.

## POLLUTION RESEARCH

### Modest Increase

OVER £1.2 million was spent by the research councils on pollution research in 1971-72. This is £181,000 more than was spent the previous year. These figures are revealed in a report, *Pollution Research and the Research Councils*, published last week by the five research councils.

The collaboration of the research councils in pollution research resulted from an enquiry in 1969 by the Council for Scientific Policy into the problems of pollution. As a result a working party was set up with representatives from all five research councils first to collate and

examine the relationships of the pollution research programmes of the research councils and, second, to identify opportunities for further liaison and joint action by the councils in certain aspects of pollution research. Since then the working party has incorporated members from outside the councils and it now includes members from industry, University and government departments. The committee now has it in its remit "to advise the government and government sponsored bodies, if requested, on scientific matters relating to the problems of pollution".

Details of where the money goes is shown in the table with the distribution in 1970-71 shown for comparison.

Table 1. Direct Pollution Research Expenditure

Kind of investigation	ARC	MRC	NERC	SRC	SSRC	Total 1971-72	Total 1970-71
Survey, monitoring and dispersal of pollutants	180	2	132	31	—	345	454
Effects of pollutants on man, animals and plants	73	245	236	33	2	589	327
Abatement, reclamation, biodegradation	169	8	5	22	—	204	199
Technological aspects	10	12	5	9	—	36	43
Information, data collection, data handling, data analysis	—	—	8	11	11	30	—
Total 1971-72	432	267	386	106	13	1,204	—
Total 1970-71	198	509	221	74	21	—	1,023

Totals in thousands of pounds sterling.