correspondence

Selling the Sun

SIR,—It is always welcome when, having written something, others take the time to read and criticise it—positively or otherwise. In your editorial (May 20, page 177) on the solar energy report¹ (to which I was a contributor) you wrote an incisive critique which pointed out some weak points but which I think did not sufficiently stress some of what may be its positive aspects.

We did formulate recommendations on priorities in solar energy research and development—see Chapter 12 of the report, from which the table below is taken.

In drawing up these priorities we studied how the USA, Japan, India, Germany, France, and the EEC had done similar exercises, and then took into account potential use within the UK and the export opportunities—the latter we consider very important in view of the already existing overseas markets and the UK's dependence on export income. Thus it is somewhat unfair to say that we advocated "an advance-on-all-fronts" attitude based only on scientific statements. As to finding figures to back up our claims, we certainly did have problems in obtaining the most up-to-date energy statistics and economic predictions. We did our best in the absence of professional economists and government experts—there are, however, 382 references in the report, and we tried to include the basis for all our facts and assumptions (in marked contrast to many other documents which form the basis for important policy decisions).

Futurology is fraught with dangers. Two government examples in the energy field may suffice. In 1952 it was

stated² that since selenium solar cells were only 0.53% efficient, "we do not consider that it is necessary to give any special encouragement to the improvement of photovoltaic cells for power production from solar energy". Silicon solar cells are now 16% efficient and we have to import all our requirements for finished polycrystalline and slices for fabrication. In 1965 the CEEB ordered an Advanced Gas-cooled Reactor (Dungeness B) on the assumption that it would be delivering electricity in 1971 costing 0.457 old pence per unit (note the three decimal point accuracy)³. In 1973 the cost of electricity from an AGR had risen to 0.57 new pence per unit. Notwithstanding these calculations Dungeness B has yet to deliver any electricity (now costing about 2.0 new pence per unit to the consumer) since it won't be ready until 1978!

Solar energy is not "free" as some may claim. It has problems of collection, storage and transmission—as do most other energy systems to various degrees. The present economic accounting systems discourage investments with high initial costs that provide long term benefits—the case for many important solar energy systems. Detailed systems analyses need to be done to help decide the options for solar energy development—the International Institute for Advanced Systems Analysis in Austria⁴ is an excellent example of such work which is immediately applicable to the UK. The construction of demonstration houses, offices, schools and solar equipment, combined with positive incentives to industry and individuals, is the way of the USA⁵. Japan has "Project Sunshine" with defined budgets and objectives out to the year 2000. The UK

needs a combination of these approaches if we are to have alternative viable energy options in the next century to be "sold" here and abroad—and not to buy from abroad.

D. O. HALL

Department of Plant Sciences,
King's College, London

¹ UK Section Intl. Solar Energy Society, *Solar Energy: a UK assessment*, (21 Albemarle St., London, 1976).

² Bullard, E. C., et al., *Research*, 5, 522–529; 1952.

³ Patterson, W. C., *Nuclear Power*, 223–224 (Penguin, London, 1976).

⁴ Häfele, W., et al., *Second Status Report of the IASA Project on Energy Systems 1975*, Intl Inst. Advanced Systems Analysis, 2361 Laxenburg, Austria, Report RR-76-1; and *Energy Strategies*, Report RR-76-8; 1976.

⁵ Morse, F. H., and Simmons, M. K., *Ann. Rev. Energy*, 1, 131–158; 1976.

Human anatomy

SIR,—Anthony Harris (Correspondence, May 6, page 10) observed that right limbs tend to exceed the left in various statistics and suggests that this asymmetry is likely to have its origin in the greater use of muscles associated with right limbs. There is evidence, however, that the superiority of the right side is already established in the foetus.

The total ridge count of the finger tips is a quantitative trait which is laid down in foetuses during the third and fourth months of gestational age and thereafter remains unaltered. Although the major component of the ridge count is genetically determined and environmental influences are thought to play only a very minor role, there is a consistent bimanual difference, the mean ridge count on the right hand being higher than that of the left (Holt, S., *The Genetics of Dermal Ridges* (C. C. Thomas, Springfield, 1968)).

An early asymmetry is also seen in the size of the foetal testes and ovaries. The right gonad is larger and contains more cells than the left in foetuses aged eighteen weeks. Although the cause is not known, an explanation in terms of greater use can surely be excluded.

These examples suggest that an asymmetry of development favouring the right side precedes any preference in the use of right sided limbs. It would seem that right-handedness has its origin in developmental anatomy, and that the original asymmetry is subsequently enhanced by differential usage. Cultural factors may increase this difference still further.

URSULA MITTWOCH

Galton Laboratory,
University College London

Suggested proportional allocation of research resources in UK for period 1976–1981 with estimates of 1981 possible market split

Application	Suggested proportion of total funds (%)	Estimated market split 1981	
		% in UK	% overseas
Space and water heating	45	80	20
Solar refrigeration and air conditioning	5	5	95
Other thermal applications especially solar pumps, solar engines, solar thermal electric power, etc.	15	0	100
Photovoltaic applications	20	20	80
Bioconversion to fuels and materials* and fermentation of biological wastes	10	40	60
Photochemistry	5	Too early to predict	

*Traditional food production studies excluded