

science may have caused its neglect by the academics. Only four British universities run substantial research programmes in polymer science, and although there are also about twelve minor schools these are insufficient to cover the subject fully. Polymer science is a growth industry, and considerable expansion in university polymer research is required if universities are to play their part in providing fundamental knowledge and trained manpower. The Polymer Panel estimates that about 100 polymer scientists are needed each year by the industry, and the present output from universities is not more than seventy a year. The SRC board has accepted that more money should be spent on training. The panel recommends an immediate doubling of financial support to about £0.5 m—the SRC has provisionally accepted that “the total funds granted may reach £300,000 by 1970 provided sufficient applications of sufficient standard are received”.

On the basis of an enquiry into the research programmes of the larger research teams in British universities, the panel has recommended various areas in which research should be initiated or more support given. These include the synthesis of new polymers (for example, three dimensional polymers, thermally stable polymers from cheap starting materials and studies of thermally labile linkages and inorganic polymers); the physical and mechanical properties of polymers and composites including the application of the concepts of metallurgy to polymers; and the engineering aspects of polymers including their design, applications and processing. The British plastics industry, which is lagging a little in the world stakes, as well as the universities should benefit from this shot in the arm.

FALLOUT

Strontium-90 Contamination Down

THE average concentration of strontium-90 in human bone in Britain fell once again last year, according to the latest report of the Medical Research Council's Committee on the Monitoring of Radioactivity from Fallout (HMSO, 3s). The committee says that the most important feature of the 1967 results is that lower values were recorded for all age groups (see Table); this decrease reflects the fall in the levels of contamination of food over the past few years. Adult bone was less contaminated than expected, but it is too early to say whether this is a real effect rather than a sampling error. Only 342 bone samples were analysed at the Atomic Energy Authority's Capenhurst laboratory, of which 23 were from people who died in the second half of 1966, and the samples analysed at Glasgow were from 188 children who had died there in 1967. Although

MEAN STRONTIUM-90 CONCENTRATIONS IN HUMAN BONE, 1966 AND 1967

Age	Capenhurst sample		Glasgow sample	
	1966	1967	1966	1967
Newborn and stillborn	2.2	1.5	2.7	1.95
6 months-2 years	6.2	4.2	8.3	5.8
2 weeks-4 years	5.1	3.6	6.5	4.1
5-19 years	2.6	2.1	4.8	4.8
20 years and over	2.2	1.6

such small samples may not be representative of the whole population, the committee notes that a similar unexpectedly large decrease in the concentration of strontium-90 in adult bone has been reported recently in the United States.

There were no adults in the sample analysed at Glasgow. In the table, the concentration of strontium-90 is expressed as picocuries per gram of bone.

SPORTING REPRODUCTION

Cloning and the Jockey Club

THE recent *in vitro* fertilization of human oocytes brings the whole question of animal cloning a little nearer in spirit if not in fact. Clones would be exact copies of an adult produced by a process of vegetative reproduction, with no act of sexual fusion intervening between adult and offspring. This has already been accomplished to some degree in amphibians, by injecting the nucleus from a tissue cell of a chosen adult into an egg cell from which the nucleus has been removed. The resulting embryos are prone to deformity, but sometimes they develop into viable adults.

Speculation about cloning people is not new. Discussions usually emphasize two questions. First, what would a nation do if a mercantile or military rival equipped itself with dozens of Einsteins or Machiavellis or whatever? Second, there is the nature-nurture question which Haldane posed by asking what would have emerged from the cloning of Rimbaud—a first-rate poet or a third-rate empire-builder?

There may be fewer difficulties with highly bred animals. Cloning, indeed, might seem ideal for a breeder of show dogs. When at long last a dog turned up perfect in the myriad parameters of concern to judges of canine quality, there would be a strong temptation to replicate the beast and, eventually, its descendants.

The Kennel Club is admirably phlegmatic about this. It predicts that the machinery already established for dealing with artificial insemination would also handle the ambiguities of cloning. Dogs sired by artificial insemination are only accepted for pedigree registration if a veterinary certificate attests the donor. The Kennel Club was unsure what would happen if a line of clones from some utterly splendid dog began regularly to usurp all the awards for a particular breed. Perhaps there would have to be special consolation prizes for uncloned animals, or perhaps clone could be pitted against clone, making the contest one of rearing rather than breeding.

Horses present a rather different situation. Horses attract attention when they run very fast, not when they approximate to some static conception of the ideal. There is also the feeling among horse fanciers that the game is the thing—that it is the uncertainties of racing which give it spice. The Jockey Club was therefore understandably cool when asked to comment on the possibility of a dozen cloned Arkles thundering neck and neck round the course at Epsom. Where horse breeding is concerned, even artificial insemination is forbidden. But apparently Japanese breeders are less fastidious—they have no objection to artificially inseminated racehorses. So it may yet be possible to see how long the Jockey Club will hold out if clones from some meteoric Japanese horse begin to sweep the board at race meetings round the world.