

Spray Steelmaking, Ltd. Two full scale experimental units have been set up, at the Lancashire Steel works at Irlam, and at Shelton Iron and Steel Co. At the experimental unit operated by BISRA at Sheffield, the control of the process has been improved. Seventy per cent of the steels in the range 0.6 to 1.4 per cent carbon are produced to within  $\pm 0.04$  per cent of specification. Irons with up to 1.0 per cent phosphorus and 0.12 per cent sulphur have been converted to low carbon steel with acceptable contents of these elements.

In the mechanical working division, successful work has been carried out on a novel method of heating strip or wire. The heating is done by an electrical discharge between the wire and an electrolyte. The difficulty is to maintain a sufficiently stable discharge to produce uniform heating, but the report says that this has been overcome. A direct current source of about 100 volts supplies the energy to a flowing electrolyte, and wire can be heated at a rate of 30 ft/minute, with a claimed heating rate of 4,000 °C per second. Efficiency of the process is about 30–35 per cent, but could probably be improved; even at this stage, however, BISRA believes the process is attractive for production of stainless steel wire, and discussions for exploitation are under way.

## No Helium Here

THE hope that natural gas from the North Sea might provide the bonus of a European supply of helium seems to be dwindling. The average amount of helium in the strikes that have been made so far at the Leman and West Sole banks is only about 0.02 per cent. This means that unless the Gas Council decides to increase greatly the volume of its liquid gas storage tanks and liquefaction plant, instead of piping the gas ashore and directly into the grid, it will not be economic to try to recover the helium. It seems likely, therefore, that all the helium used in Britain will continue to be imported from North America. At present the two chief suppliers ship helium in cylinders, although there have been experiments with shipping liquid helium from wells in Saskatchewan and Texas, where the natural gas contains up to 2 per cent helium. Although transport costs account for about three-quarters of the price of helium in Britain, for the present at least it appears to be uneconomic to recover helium from natural gas unless it constitutes more than about 0.5 per cent of the total or unless the operation is on a very large scale.

The situation, of course, may change if the world demand for the gas increases greatly—recent developments in cryogenics make some increase in demand inevitable—and shows signs of outstripping supply. This might happen, because apart from the North American sources the only other supplies are a well in South Africa and one in Russia which meets East European demands. Moreover, there have been pessimistic suggestions that the US wells might run dry in the 1980s. But until there are clear signs of a shortage it is unlikely that North Sea gas will become a source of helium.

## Nucleation of a Society

SINGLE crystals have long been necessary both for academic research and for device applications. The

demand for good quality crystals has grown very rapidly with the increasing use of solid state devices such as transistors, integrated circuits and lasers. In spite of this demand, the growth of single crystals has been regarded as a Cinderella subject for many years, particularly as it does not lie within any of the established scientific disciplines. Recently crystal growth has become recognized as a subject worthy of study as a science, and the first international conference on crystal growth was held at Boston, USA, in 1966. Regular national meetings on crystal growth are now held in the USA and the Soviet Union.

The first meeting of British crystal growers was held at Imperial College on April 19 under the chairmanship of Dr E. A. D. White, of the Electrical Engineering Department. The meeting was attended by about sixty crystal growers, from as far afield as Edinburgh and Dublin, who heard five speakers on recent developments in crystal growth techniques. After a broad review by Dr White which included recent theoretical advances, Dr B. A. Smith (University of Sheffield) surveyed the field of growth from the melt with particular emphasis on the arc transfer process. There were two papers on growth from aqueous solutions; F. W. Webster (I.R.D., Newcastle) spoke on improvements in hydrothermal equipment, and Dr D. Bloor (Q.M.C., London) on the use of gels to control the rate of diffusion of two interacting solutes. Dr J. M. Robertson (Portsmouth College of Technology) described recent experiments on flux growth in controlled atmosphere, in particular the effect of oxygen pressure on the ferromagnetic resonance linewidth of ferrite crystals. The success of the meeting was evident from the liveliness of the ensuing discussion.

It is intended to hold informal meetings of this nature three times a year, and ultimately to create a formally constituted Crystal Growth Society. However, the next national meeting will not take place until December of this year, because the second International Conference on Crystal Growth will be held in July at the University of Birmingham.

## Marriage Bureau for Animals

A NEW committee, known as the Conservation and Breeding Committee, has been set up by the Federation of Zoological Gardens of Great Britain and Ireland. One of its aims will be to act as a marriage bureau for all zoo animals. It will keep a register of unmated animals (whether rare or not), and it will encourage member zoos to find unpaired specimens. At present twenty-seven zoos are members of the federation, out of a total of about seventy-four zoos in the country. On application for membership of the federation, all zoos are inspected by an independent panel including a veterinary surgeon. They are only accepted if they reach the standards laid down by the federation. So far thirty have applied since 1966, when the federation was established, and all but three have been accepted.

Already there have been some exchanges of animals between zoos for breeding purposes. The London Zoo, for example, has loaned a male bobcat to Twycross Zoo where there are two females, and a male pygmy hippo from Chester Zoo has gone to Whipsnade where there are four females. Although the bureau is intended primarily to help member zoos in breeding