

evidence which would command academic approval, and as far as is known no government agency has been asked by the police to assess the spectrographs. On the telephone, the manufacturer declined to say which police forces had bought the spectrographs.

Phoneticians both in Britain and the United States are considerably alarmed by the attempts to introduce voiceprints as legal evidence. It is well known that the voice changes with age and with emotion, and can be disguised and mimicked. Each such source of variability produces corresponding changes in spectrograms and voiceprint changes which are more than likely to conceal the posited but still unproved uniqueness of the individual voice. The circumstances in which recordings for legal use are likely to be made, for example by telephone tapping, are notorious for distorting sound; comparison of a voiceprint made from such a recording with one taken directly from the suspect presents yet further difficulties of interpretation.

Mr Kersta's *Nature* article of 1962 remains, as far as is known, the most serious attempt to evaluate voiceprints. Since then he has apparently been less cautious in his claims. Perhaps because of the lack of published material, there seems to have been a disinclination in academic circles to take these claims seriously. A thorough assessment is likely to be a lengthy and somewhat unrewarding task, which may be one reason why the several experiments which militate against the claims have been conducted on an informal basis and remain unpublished.

How Much Electricity?

THE electricity generating industry in Britain has just made an odd decision—that £16 million can be saved from the investment programmes because of revisions in the trend of demand for electricity. This reduction is very small when seen against the total investment programme of the electricity generating boards, and in the ordinary course of events would hardly be worthy of comment. But the £16 million cut has come on top of cuts of £17 million made in the public expenditure crisis of December 1967, and at a time when the Central Electricity Generating Board is talking cheerfully of a return to traditional growth rates for electricity consumption, after several years of relative stagnation. Those suspicious of the Ministry of Power's estimates have thus been given further ground for doubt; it looks as if the ministry's estimates are simply adjusted to fit short term capital shortages.

The industry's record in estimating demand over the past ten years has been woeful. First, in the early fifties, the estimates were pitched far too low, a mistake which led directly to the power cuts of 1962–63. The estimate made in 1953 for demand in 1959–60 was no less than 10 per cent too low. From this, the industry went to the other extreme, urged on by the "expansionist" phase in economic management between 1964 and 1966—the time of the National Plan. The estimates made in the early 60s were as bad as those of the 50s, though in the other direction; the only thing that saved the CEGB from a vast over-capacity was its inability to get power stations finished on time. Thus in 1968–69, the plant actually in commission (46,400 MW) would have fallen 7 per cent short of demand if the original estimates had been right. In fact, it

represents an over-capacity of about 25 per cent. The past two years, since the abandonment of the plan, have seen reductions in the estimates. Last year, for example, the Electricity Council said that demand in 1972–73 would be 54,000 MW; this year it says that this demand will not be reached until 1973–74, and that demand in 1972–73 will be only 50,600 MW. The average rate of growth of consumption between now and then will be 7.2 per cent a year; last year the council thought it would be 7.3 per cent.

There seems to be no particular reason for believing that this latest estimate will be any more reliable than its predecessors. But it does seem to reflect a lack of optimism in the effects of devaluation which might not be endorsed by the Government. In any case, it is a pity to postpone investments now which in the long term are the only way of reducing electricity charges to the consumer. If the industry has too many power stations in 1974, it can at least scrap some of the old and inefficient ones; but if it has too few, it will look very silly indeed.

Meanwhile, the Electricity Council is looking for a new chairman. Sir Ronald Edwards, chairman of the council since 1962, announced last week that he would resign at the end of October, to become chairman and chief executive of the Beecham Group. The job at present pays £12,500 a year, but may have to be increased to attract the right applicant. It is also possible that any new appointment would be tied in with a plan to reorganize the electricity generating industry.

New Ways to Make Steel

THE British Iron and Steel Research Association seems to have managed the transition from private to public status without disruption. Since the British steel industry was nationalized on July 28, 1967, BISRA has had two roles to fill—as the inter-group laboratories of the British Steel Corporation and as a research association continuing to serve the companies still in private hands. So far, the change is not apparent, at least in the work which is discussed in the annual report of BISRA, most of which is along familiar lines.

During the year trials began on a new steelmaking process, designed to make steel from cold charges. This uses an atomized spray of oil burning in oxygen as the only source of heat for steelmaking. Most of the development work is being carried on at Dorman Long (Steel) Ltd, where an 80 tonne vessel has been commissioned. The lessons learned with a small half tonne vessel are being applied to the larger scale development, and the intention is to devise the best possible working conditions and then to compare the process with the electric arc process. The charge is a mixture of scrap and pig-iron, and the burners use oil and oxygen in different proportions to produce different final steel compositions. Two kinds of burner have been used; a Dorman Long burner in which the oil is atomized with steam, and a BISRA design in which the atomization is carried out by what are called "swirl inserts". So far BISRA is not saying how well the process works.

Another major development in steelmaking, the spray process, has now passed out of BISRA's hands and is the responsibility of a wholly owned subsidiary,

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 ± 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