

Direct broadcasting

Unravelling an encryption code

A TECHNICAL standard for encoding European television could be on the way. A study of the technical and economic aspects of subscription television is to be carried out in the next six months by the London-based consultancy group Communications Studies and Planning International (CSPI), through a commission from the British Home Office.

The study is an attempt to comply with one of the findings of a report on the financing of the British Broadcasting Corporation (BBC) published in July and compiled by a committee led by Professor Alan Peacock, research professor in public finance at the Esmee Fairbairn Research Centre, Heriot-Watt University in Edinburgh. It recommended that subscription television might be an option for the future financing of the BBC. The results of the CSPI research, however, will have wider implications.

Direct broadcasting by satellite (DBS) television is to be launched in mainland Europe next year, supposedly by West Germany in the spring, followed by France in the autumn. By the end of this year, the British are to select an operator for a DBS television service across the United Kingdom. A potential audience of 120 million European homes could receive television programmes via a satellite dish antenna about 90 cm in diameter. In most cases, the pictures will be encrypted and the service financed by subscription.

How the British DBS television service will operate is still unclear. The Independent Broadcasting Authority (IBA), the controlling authority over British commercial broadcasting, has been charged with the task of selecting the British DBS operator from five applicants. The IBA decision is expected by the end of the year and would mean the launch of a British satellite by about 1990.

The British are thus at least two years behind West Germany and France in their commitment to DBS. The vacillations of the BBC, which was originally awarded the DBS franchise about four years ago, caused much of the delay. The corporation proved reluctant at that time to commit itself to an expenditure estimated to be more than £350 million over a seven-year life of a DBS satellite.

The CPSI research will cull a great deal from the US experience where a plethora of cable television networks has meant the extensive use and development of encryption and subscription techniques. The result could be a single encryption/subscription technical standard in the United Kingdom for terrestrial and satellite broadcasting.

Bill Johnstone

Nobel prizes

Growth factors bring rewards

WITHIN weeks of winning this year's Lasker award in basic science (see *Nature* 323, 289; 1986), Stanley Cohen of Vanderbilt University School of Medicine in Nashville and Rita Levi-Montalcini of the Institute of Cell Biology in Rome have shared the 1986 Nobel Prize in Physiology or Medicine. Again, the citation is for their work on growth factors. Levi-Montalcini has spent much of her life working on nerve growth factor (NGF), which she dis-



Levi-Montalcini (left) and Cohen. Lasker awards last month, Nobels this.

covered in the early 1950s; Cohen worked with her at Washington University, St Louis, on the purification of NGF between 1956 and 1958 but on moving to Vanderbilt turned his attention to epidermal growth factor (EGF), upon which he has continued to focus.

Remarkably, Levi-Montalcini was a medical student in Turin, Italy, with two other subsequent Nobel laureates, Salvador Luria (Physiology or Medicine 1969) and Renato Dulbecco (Physiology or Medicine 1975). She graduated in 1936 but left Italy for Brussels in 1939 after Jews were barred from academic or professional careers. Returning to Italy shortly before Belgium was invaded by Germany, she built a laboratory in her bedroom and set about studying the effect of peripheral tissues on the development of nerve centres. In this she was joined by Professor Giuseppe Levi, previously her teacher.

Levi-Montalcini has attributed her devotion to a small neuroembryological problem "when all the values I cherished were being crushed" to "the well-known refusal of human beings to accept reality at its face value". Forced to leave Turin because of heavy bombing in July 1942, she rebuilt her laboratory in a small country house, under far worse conditions. Electric power was cut off every few days and the eggs she used for her experiments were in short supply. A year later she had to flee to Florence where she assumed a false identity and a precarious existence until the end of the war.

Fortunately, a paper by Levi-Montalcini and Levi, rejected by Italian

journals on account of the non-Aryan names of its authors, had been published by the Belgian *Archives de Biologie*, and read by Viktor Hamburger, who in 1946 invited Levi-Montalcini to join him in St Louis.

By 1951 they had discovered that certain mouse tumours release a substance that induces nerve fibres to grow. The bioassay for the substance was developed during a visit of Levi-Montalcini to the Biophysics Institute of the Medical School of Rio de Janeiro in 1952 and the substance assumed its present name in 1954 — having been termed nerve growth stimulating factor until then.

Shortly thereafter, Stanley Cohen joined Levi-Montalcini in an attempt to purify NGF and in the course of so doing discovered that snake venom and mouse salivary glands were rich sources of the factor. Cohen identified NGF as a protein and established its molecular weight. He also made antisera to purified NGF and showed that they would destroy the sympathetic ganglia of newborn mice.

Levi-Montalcini returned to Italy in 1961 and has since worked in Rome. Much of her work has been on the functions and mode of action of NGF, which was finally sequenced in 1971.

On moving to Vanderbilt, Cohen began his studies of another factor in salivary glands, which he isolated in 1962 by its ability to accelerate eyelid opening in the newborn mouse, still the standard bioassay. Cohen had determined the structure of EGF by 1972 and thereafter increasingly turned his attention to the factor's receptor.

He established that after EGF has bound to its cell surface receptor, the complex is internalized into the cell (one of the first examples of receptor-mediated endocytosis, a central component of the work for which Michael S. Brown and Joseph L. Goldstein shared the Nobel Prize for Physiology or Medicine last year), and that the complex has tyrosine protein kinase activity, which provides a link to oncogenes.

Cohen is much admired for his modesty and the fact that he still gets his hands dirty in the laboratory. He is, says an admirer, an experimentalist *par excellence*, who has always been first and right in his experiments. Of his time spent working with her on NGF, Rita Levi-Montalcini has written "Stan used to spend the entire day and most of his evenings ... meditating with eyes half-closed smoking his pipe, and playing his flute (his main talents were, however, not in this direction)". The Columbus Day and Yom Kippur holiday this week prevented a progress report on his flute-playing.

Peter Newmark