assessed and closely monitored by laboratory managers. (Efforts by researchers to ensure that their ideas are taken up by development staff are, however, now rewarded by salary bonuses, an innovation to reflect the changing times.) And Penzias believes in allowing researchers total freedom of inquiry. Mitchell Marcus, a linguistics and artificial intelligence researcher, agrees that he is given "more freedom than in a university". Alan Huang, who heads what may be the only corporate optical computing research department in the world, says he was "startled" shortly after divestiture to be told to take more risks in his research.

Huang's futuristic theorems on pattern recognition algorithms that might one day form the basic logical operations in optical computers are clearly exceptional, but his upbeat assessment of the post-divestiture working environment at Bell Labs is shared by many others. However, there is a niggle: Bell Labs have made a decision to be more careful about the information they will allow researchers to publish.

The irritation arises because recognition by peers is an important form of feedback, not entirely compensated for by the knowledge that permission to publish is being denied because of the possible importance to AT&T of the results being reported. Ross says he favours publishing more, but with "more on what we've done and less on how we did it". Fewer than one per cent of the 4,000 papers submitted for publication clearance each year are turned back for revision, but it seems to be accepted that irritation over this has increased: Ross says he is watching the subject "closely". Penzias cites the case of Narendra Karmarkar's celebrated algorithm in linear programming, now being used by AT&T for designing Pacific basin communication networks, as an example of the successful and judicious application of the policy: although Karmarkar's particular implementation of the algorithm remains proprietary, enough details were released for publication for Karmarkar to receive public recognition and win academic prizes.

Ross opposed divestiture at the time the question was being examined in court, and says he still believes the decision was a mistake. But it has allowed — or obliged — Bell Labs to be more responsive to technical developments. Ross complains that Bell Labs' most famous invention, the transistor, was brought into every home in transistor radios by other companies while AT&T spent 20 years in developing a version reliable enough for use in its only permitted application: telephone switching equipment. When the next "transistor" is invented, Ross says, "we can take it wherever we want". And, perhaps with good reason, he seems to have no doubt that there will be a next time.

Tim Beardsley

Israeli–Egyptian cooperation

Minor relic of Camp David

Rehovot

THE grandiose dreams of large-scale scientific cooperation between Egypt and Israel that flowered in the wake of Anwar Sadat's visit to Jerusalem in November 1977 and the peace treaty of March 1979 have not materialized. Nevertheless, despite intervening political storms, joint research projects in agriculture, mariculture and medicine have been quietly taking place.

As with the Camp David negotiations, US go-betweens have played an important role; the trilateral Cooperative Arid Lands Agriculture Research Programme (CALAR) was set up by researchers from Egypt, Israel and the United States at the University of San Diego, California, in June 1981, with financial support from the US Agency for International Development.

Although research programmes are developed and carried out independently in each participating country to suit specific conditions and needs, experience has shown that lessons learned in one are generally applicable in the other. This is certainly true of the exploitation for agricultural purposes of the abundant quantities of saline water in both Israel and Egypt.

One of the participating scientists, Professor Jehoshua Rudich of the Hebrew University's Faculty of Agriculture in Rehovot, points out that the Israeli practice until now has been to dilute saline water found in its desert regions (normally some five times as salty as ordinary irrigation water) with fresh water until it is only twice as saline. It is then used to irrigate salt-tolerant crops, notably cotton and melons.

More recently, within the framework of the CALAR programme, undiluted brackish water has been used to grow tomatoes (following the use of small quantities of sweet water to reach the flowering stage). The yields were slightly below normal, but the tomatoes were of high quality colour, acidity and flavour.

In parallel work in Egypt, Dr Adel S. El-Beltagy and his colleagues have shown, according to a recent CALAR report, that the local Edkawy variety of tomato is highly suitable for cultivation with saline water. They are, at the same time, producing water of various degrees of salinity and testing it with different methods of irrigation (drip, furrow), as well as studying how yields are affected by such factors as planting distances, windbreaks and fertilizers.

Another CALAR project in both countries involves the development of drought-resistant forage shrubs to feed sheep and goats. While the exploitation of brackish

water is naturally emphasized, Dr Dov Pasternak of Israel's Ben-Gurion University, has set his sights on using water taken directly from the Mediterranean. His team has achieved encouraging results with approximately 50 plant species, most of them from the parched interior of Australia.

The Egyptians, meanwhile, have achieved significant progress in cross-breeding the Barki goat, a hardy native of their desert regions but a low producer of milk, with the high-producing Damascus goat.

A third sphere under investigation is the cultivation of crops that can be used as industrial raw materials. Successful results have been achieved in the deserts of both countries with jojoba, guayule and buffalo gourd.

Although political factors have kept cooperation out of the headlines, it has been reflected in more than a dozen joint Israeli-Egyptian presentations at international gatherings as well as joint papers in international scientific journals, mostly on the endemic parasitic afflictions leishmaniasis and malaria.

Medical cooperation began, however, with the mosquito-borne viral disease called Rift Valley fever. Ordinarily confined to central and southern Africa, it has killed 598 people and thousands of animals in Egypt since 1978. Israeli experts, fearing a further spread of the disease, readily agreed to a suggestion by the United States of discussions with their Egyptian counterparts.

Israel's main contribution has been made by a team led by Professor Rachel Galun of the Hebrew University's Kuvim Centre for the Study of Infectious and Tropical Diseases, which carried out studies on the behaviour of the mosquitoes that transmit the virus to cattle, sheep and man. Her findings were almost certainly of use in helping Dr Sherif El-Said of Ain Shams University and his colleagues in their successful efforts first to monitor and then to stamp out Rift Valley fever in Egypt.

Hebrew University researchers also worked together with Egyptian doctors and scientists after an outbreak of visceral leishmaniasis in Egypt. On that occasion, efforts in Jerusalem centred on the detection of antileishmanial antibodies by use of a new method that was developed there.

"Like all good cooperation", Professor Galun explains, "that between the Egyptians and ourselves has been based on mutual self-interest. For we both realize that infectious diseases and the vectors that carry them do not respect national boundaries."

Nechemia Meyers