Chinese irrigation

Yangtze to cross Yellow River

CHINA is to accelerate preparatory work on its ambitious project for diverting water from the Yangtze to the Huang-Huai-Hai plains of the north. Construction of the first stage of the project — from the Lower Yangtze to Lake Dongping on the southern banks of the Yellow River — has already begun. The new studies will be concerned with the optimum amount of water that can be transferred, the environmental consequences of the scheme for the lower Yangtze, the overall economic and social consequences of the project and various individual technologies, including the development of large pumps.

The chief objective of the transfer project is to remedy the basic mismatch of China's land and water resources. In the south, the Yangtze, with an annual volume of 980,000 million m³, flows through an area of poor and unproductive soil, while in the north, potentially high quality land cannot be cultivated due to lack of water. The endemic water shortage of the north

under gravity to Tianjin.

Considerable pumping capacity will be needed to effect the 40-m rise from the Jiangdu intake to the highest point (at the Yellow River). Ten major pumping stations are planned with a total installed capacity of nearly 1 million kW. Initial estimates suggest an annual delivery rate of 14,000 million m³ in an average year, rising to 30,000 million m³ in drought years. This will provide new or improved irrigation to some 200 million hectares of land and an additional 2,700 million m³ of water annually for industrial, mining and municipal purposes.

The cost of the diversion has been estimated at a minimum of 10,000 million

yuan (£3,400 million), which, theoretically, will ultimately be recovered in increased agricultural and industrial productivity.

Some concern has, however, been expressed by the United Nations University team that the increase in soil productivity may be less than expected if the ground-water level of the newly irrigated areas is not carefully controlled to avoid an increase of soil salinity.

Another possible hazard is schistosomiasis. The incidence of this disease, which 30 years ago affected an estimated 7 million Chinese, has been considerably reduced by intensive drives to exterminate the snail vectors of the disease, but it remains endemic in southern China. Unless effective countermeasures are taken, the massive transfer of water could also result in the migration northwards of disease-carrying snails.

Vera Rich

French research

Papon looks ahead

THE French Centre National de la Recherche Scientifique (CNRS) is turning the usual means of research support upside down. While continuing to invite researchers to ask for grants, it has set up a series of "crystal ball" groups to identify emerging fields of research, some of which would be selected for special support.

Thus Professor Jean Audouze, director of the CNRS astrophysics institute in Paris, will report soon as leader of a group investigating the future of particle physics in conjunction with astrophysics. Another group is at work on the relationships between chemistry, biology and informatics.

Other such groups are to be set up shortly, as the result of a hot-house seminar of the CNRS directorate held this summer at the Chateau d'Amboise on the Loire. Pierre Papon, director-general of CNRS, and his colleagues concluded that there should be more such future-gazing, and that CNRS should try to concentrate its resources better.

Not that CNRS is disappointed in the past. Speaking at a press conference in Paris on Tuesday, Papon claimed successes for CNRS in 1983 in its contributions to the detection of the intermediate vector bosons, to the development of the free electron laser, in oncogenes (the concept that more than one such gene is necessary to cause cancer) and research claimed to suggest that one of the solar oscillations is driven by gravitational waves from the gamma-ray source Geminga.

In 1984, a laboratory for aquaculture is to be set up at l'Houmeau on the Atlantic coast, in conjunction with the French ocean development organization CNEXO; a materials science institute will go up at Nantes, on the Loire; groups working on drugs-related research will be brought together to form an institute in Paris; and, in the social sciences, an institute on

contemporary society will be established in north Paris, and an interdisciplinary programme set up on "technology, employment, work and way of life".

CNRS has signed conventions on common research objectives with many French institutions, and will sign with more, including industry and regional authorities, said Papon (who is taken with "opening up" CNRS to the outside world); it will offer more grants (known as BDI) to attract high fliers from the *grandes écoles* to train through research, encourage fellowships for European travel and rationalize the system of evaluating the work of CNRS researchers to reduce the amount of paperwork a researcher has to do to maintain his or her funding. Papon will do this on a total budget next year of FF 7,735 million (£645 million), 10 per cent up on 1983.

Robert Walgate

Genetics Inst. deal

ALLIED Corporation, the major US chemical manufacturer, has reached an important financial and research agreement with Genetics Institute Inc., the Cambridge (Mass.) company set up three years ago by Dr Mark Ptashne and Dr T. Maniatis, both of Harvard University. A spokesman for Allied said this week that the company has paid \$10 million for a share of the equity in Genetics Institute, and that it would also pay between \$5 million and \$15 million over the three-year initial duration of a research agreement covering new diagnostic products.

The agreement does not at this stage cover other products that may be developed at the Cambridge laboratories, soon to be occupied. Allied would be responsible for the clinical testing and regulatory approval of materials resulting from the joint programme.

has been exacerbated in recent years by rapid industrial development, particularly in the coal-mining areas of Shanxi province, which has, moreover, led to the pollution of many of the remaining water reserves.

Feasibility studies carried out by the Academy of Sciences and the Tokyo-based United Nations University have focused on the transfer of water from the middle reaches ("middle route") and lower reaches ("east route") of the Yangtze. Although the middle route has a number of technical advantages — in particular, no pumping would have been needed — the State Council decided last March in favour of the east route which, with a length of 1,150 km, is also the shortest. The route will start from a pumping station at Jiangdu on the lower Yangtze and will follow part of the ancient Grand Canal (which will be enlarged and modernized) through lakes Hongze, Luoma, Nansi and Dongpi (serving as flow-control reservoirs) to pass under the Yellow River through a 0.6-km tunnel. It will then flow