news and views

Nations and numbers 1976

from Robert M. May

LAST year I gave a summary (*Nature*, **261**, 12; 1976) of the 1975 estimates of population magnitudes, growth rates, age structures, and patterns of urbanisation which were compiled for individual countries and for regional groupings by the Environmental Fund (1302 Eighteenth St, Washington, DC). Their 1976 wall-chart shows much the same figures, with the total world population swollen by about 94 million to an estimated 4,241 million, and still growing at around 2.2% per annum.

The many uncertainties in population estimates are perhaps best illustrated by the figures for the USA. The Environmental Fund gives the mid-1976 population to be 222.2 million, as opposed to the US Bureau of the Census figure of 215.7 million. The discrepancy arises because the official figure does not include the undercount of about 5.3 million which has been announced by the Bureau for its most recent census in 1970, nor does it include an estimated 1.2 million illegal immigrants (constituted of 800,000 who entered illegally and evaded deportation, and 400,000 from among the 11 million foreign visitors who entered legally during the past year).

Such uncertainties are writ large for China, which has issued no official figures since 1956. Estimates of the current Chinese birth rate range from

37 to 17 per 1,000. The Environmental Fund chart uses Aird's 'intermediate model' (Foreign Demographic Analysis Division, US Department of Commerce, 1975) for the population of China. This is substantially higher than the US Bureau of the Census estimate, whose world population figure is consequently 4,069 million. The UN estimate for China is yet lower; highest is the CIA estimate.

Overall, the UN estimates the world birth rate to be 33 per 1,000, one less than it was 20 years ago. The Environmental Fund chart shows 35 per 1,000. As available data are not accurate to better than 2 per 1,000, the exact number is anyone's guess.

The chart also summarises the number of acres of arable land per person (from the 1974 United Nations Food and Agriculture Organisation, *Production Yearbook*, **28**). Although there are considerable difficulties in definitions here, the trends are interesting: an average of 1.2 arable acres per person in Africa; 0.5 in Asia; 2.3 in North America; 0.8 in Latin America; 0.7 in Europe (0.3 in the United Kingdom); 2.2 in the USSR; 5.3 in Oceania. Among countries with more than 10 million inhabitants, low is 0.1 for Holland, Japan and South Korea, and high is 8.1 for Australia.

Of the 158 countries listed in the

chart, 35 were net exporters of cereal grain in 1948–1952; 18 remained in 1974 (*UNFAO Trade Yearbook*, **14**, 1960 and **28**, 1974). By regional grouping, the figures for net export of cereal grain, in millions of metric tons, 'then' (1948–1952) and 'now' (1974) are: Africa, –0.4 and –6.9; Asia, –5.8 and –47.1; North America, +22.5 and +76.4; Latin America, +1.2 and –0.4; Europe, –20.8 and –28.5 (United Kingdom, –6.9 and –7.3); USSR, +2.1 and +0.7; Oceania, +3.2 and +6.9.

These and other similar figures underlie the UN projections for annual growth in food supplies and in population until 1985 (see Murdoch and Oaten, *BioScience*, **25**, 561; 1975). For Africa, the projection is for 2.5% per annum growth in food supplies and 2.9% in population, for Asia (excluding China), 2.4% in food and 2.6% in people; for Latin America, 2.9% and 3.1%. Summing over all 'rich countries', the projections are for 2.8% per annum growth in food supplies and 0.9% in population; for 'poor countries', 2.6% and 2.7%. These trends are disturbing. They are made more so by the facts that the projections ignore rising energy costs, that a large fraction of the world population is malnourished at present and that the past UN projections have consistently erred towards optimism. □

Multiple controls in bacteria

from John Scaife

THE early choice of bacterial fermentation systems for gene control studies was a fortunate one. They prove to be excellent models of multiple gene control, readily analysed both *in vitro* and *in vivo*. The control of the lactose (*lac*) operon for example has two known components: a repressor protein and a protein termed CRP. The repressor, which directly governs the bacterium's response to β -galactosides, blocks the

binding of RNA polymerase to its site in the promoter where transcription is initiated. CRP actively facilitates this binding step (see Gilbert in *RNA Polymerase*, edit. by Losick, R., and Chamberlin, M., Cold Spring Harbor Laboratory, 1976) using 3', 5'-cyclic AMP as a cofactor. It thereby mediates in the *lac* operon the repressive effect of glucose (catabolite repression) to which many degradative operons are

subject. Glucose modulates the amount of cyclic AMP in the cell.

Within the *lac* promoter the CRP-binding sequence (Beckwith, Grodzicker, and Arditti, *J. molec. Biol.*, **69**, 155; 1972) has now been identified among promoter fragments *in vitro* (Majors, *Nature*, **256**, 672; 1975). It lies upstream from the polymerase binding site. Interestingly the normal polymerase site in *lac* deviates signifi-