are regularly patrolled and maintained—should be erected.

It would be wrong to suggest that Ceylon has either too many or too few elephants, although it is said that King Raja Sinha I in 1588 raised 2,200 elephants locally, and with little effort, for his attack on the Portuguese fort at Colombo. It is unlikely he could do the same today with the same effort. The country has an elephant population in balance with its supporting ecosystem. Today, however, with the need for increased agricultural production never greater, that balance is under threat. There has seldom been such a clear-cut possibility for ecosystem conservation.

MEMBRANES

All Change

from a Correspondent

SEVERAL studies with the scanning electron microscope have recently been made of the surface of normal and transformed cells. Without a doubt, the most beautiful and informative pictures published so far appeared in the May issue of the *Journal of Cell Biology* (**57**, 815; 1973) in articles by Porter, Prescott and Frye and by Rubin and Everhart. Porter *et al.* followed changes in the surface morphology of a synchronized but dense population of Chinese hamster ovary cells during different phases of the cell cycle, and found that after mitosis, as the cells begin to spread out, there is a high incidence of "blebs" or bubble-like protuberances of the cytoplasm, intermingled with numerous, small microvilli. The photographs also show the most extraordinary long, thin filopodia extending from the cytoplasm to the surface of the coverslip or to neighbouring cells. As the S phase is traversed, and the cells begin to spread out more thinly and to touch one another, the blebs disappear and the number of microvilli is reduced, but as the cells prepare for mitosis again the microvilli reappear and by late G_2 the rounded cells are almost entirely covered by these structures.

Previously it had been shown (Puck *et al., Proc. natn. Acad. Sci., U.S.A.*, **69**, 1943; 1972) that treatment of CHO cells with cyclic AMP and testosterone inhibited the appearance of "violently extending and retracting knob-like structures" on the cell surface and caused the cells to extend into fibroblast-like shape. Treatment of extended cells with cytochalasin B or colcemid (agents which disorganize microfilament or microtubule components respectively) caused the appearance of knobs. It is therefore interesting that Porter *et al.* state that in CHO cells treated with cyclic AMP there is obvious alignment of microtubules parallel with the long axis of the cell, whereas there is little or no apparent organization in normal CHO cells.

Antagonism between the effects of cyclic AMP and colchicine of another kind is now reported by Kram and Tomkins (*Proc. natn. Acad. Sci., U.S.A.*, **70**, 1659; 1973) who have extended studies on the inhibitory effect of cyclic AMP on the serum-stimulated uptake of low molecular weight metabolites by 3T3 cells. They found that this inhibition is overcome specifically by cyclic GMP, and also by vinblastine and colchicine. Moreover, the last two substances stimulate uridine uptake in serum-deprived cells (without affecting the intracellular level of cyclic AMP), but cytochalasin B had no effect.

It remains to be seen how these biochemical changes in the state of the cell membrane relate to the morphological changes seen with cyclic AMP and other agents affecting microtubule assembly. Returning to the electron microscopy of cell membranes, the same issue of the *Proceedings* contains an article by Gregg and Nesom (*ibid.*, 1630) on the response of amoebae of the slime mould *Dictyostelium* to cyclic AMP. When they used the freeze-fracture technique to look at the inner surface of the plasma membrane, they observed numerous protuberances which averaged 60 Å in diameter. Several hours after exposing the amoebae to cyclic AMP the size of these particles, which probably represent proteins or clusters of proteins embedded in the phospholipid bilayer, had increased about 1.7 times. Again the relationship between these morphological changes and biochemical alterations in the membrane leading to increased adhesiveness of the cells remains to be determined.

HUMAN ADAPTABILITY

Biology of New Guineans

from a Correspondent

A DISCUSSION meeting on human adaptability in a tropical ecosystem at the Royal Society on June 21 brought together most of the participants in a multidisciplinary study which involved investigations, jointly sponsored by the Royal Society of London and the Australian Academy of Sciences, on two contrasting populations in New Guinea; one a coastal group living in hot humid conditions on a small fertile island, Kar Kar, and the other living in a mountainous region near Goroka.

Apart from the intrinsic biological interest of the New Guineans, Professor R. J. Walsh (University of New South Wales) emphasized the short time that remains before the whole traditional pattern of life in New Guinea becomes irrevocably altered by European influence. He also mentioned one of the disturbing effects of a large-scale multidisciplinary investigation on unsophisticated peoples; apparently considerable resentment eventually arose in the

The Third Strand

IT has been pointed out that the preferred conformations of mononucleotides are conserved in DNA and RNA double helices. Arnott and Bond in next Wednesday's *Nature new Biology* present further evidence that they are also conserved in the third strand of triple helical complexes of synthetic polynucleotides. They studied, by X-ray diffraction, fibres drawn from the three stranded complex poly(U).poly(A).poly(U). This they show can exist as a 12 or 11-fold triple helix according to the humidity, but replacement of the poly(A) by poly(dA) gives only the 11-fold helix. To a first approximation either structure can be viewed as a standard complex of poly(A).poly(U) with Watson-Crick base pairing between antiparallel strands in a configuration closely resembling A′-RNA and with the third strand of poly(U) coiled up in the major groove and running parallel to the poly(A). The strands are aligned in the fibre in a hexagonal net with screw disorder as in A″-RNA. A striking result is that the conformational angles of all three strands are similar to those found in A-RNA, and that the structure is remarkably compact with a minimum effective diameter scarcely greater than A-RNA. This structure is isogeometrical to poly(C).poly(G).poly(C)—in the form with one extra proton. It is thus possible that three stranded helices could form in RNA if built round a central strand with a run of purines. Such structures may be of biological significance in the structure of chromosomes or in the role of poly(A) sequences in messenger RNA.

Similar conclusions concerning the conservation of conformation angles were previously drawn by Arnott and Bond (*Science, N.Y.*, **181**, 68; 1973) in their study of poly(I).poly(A).poly(I). This is the more remarkable because only purine bases are involved. In this structure one strand of poly(I) ran antiparallel to the poly(A) and the other parallel. Although the interglycosidic link distance was different from the Watson-Crick value for the antiparallel poly(A).poly(I) interaction —13.0 Å—they suggested that this conformation was the one used in anticodon-codon interactions in the wobble position.