these carriers had not been infected by each other nor from the same source. In families where the mother was a carrier, however, the twenty-two children who had antigenaemia had, with a single exception, the same subtype as their mother. Among the twelve families where the mother was positive only one had mixed subtypes; while ten out of twenty families in which the mother did not carry the antigen had antigen of different subtype. Among six families in which the father was positive, mixed subtypes were found in four of the families.

The data thus suggest that vertical transmission from mothers to their children occurs, and also that horizontal transmission clearly takes place. Although vertical transmission and perinatal transmission from mother to child occur, the relative importance of each mode of transmission is not yet determined.

The significance of hepatitis B infection in early life lies not only in its relation to liver disease but also in its importance in the genesis of prolonged carriage of hepatitis B viris. Zuckerman and Taylor (*Nature*, **223**, 81; 1969) described a well-documented healthy former blood donor carrying hepatitis B antigen for at least 20 years. That a reservoir of chronic carriers may become established among children is, therefore, a cause for the utmost concern to the community. Methods for passive immunisation of susceptible newborn infants are already under evaluation, but the need for safe and effective vaccines is pressing. As a corollary the serum of pregnant women should now be routinely examined for hepatitis B antigen.

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# More to muscle than myosin

IN ways not anticipated, myogenesis has yoked in an uneasy alliance muscle biochemistry, molecular genetics and cell differentiation. The finding of Ishikawa and colleagues (*J. Cell Biol.*, **43**, 312; 1969) that arrow-head complexes—the *sine qua non* of actin—can be induced by H-meromyosin in the cortical regions of cartilage, nerve and intestinal epithelial cells, as well as in many kinds of embryonic cells, has been confirmed in many laboratories. Adelstein and colleagues (*Proc. natn. Acad. Sci. U.S.A.*, **69**, 3693; 1972) and others have found myosin in platelets, fibroblasts and nerve cells. Tropomyosin, the third of the contractile protein triumverate, has also been found in several cell types (Cohen and Cohen, *J. molec. Biol.*, **68**, 383; 1972). Clearly many kinds of cell synthesise molecules identical or similar to actin, myosin and tropomyosin—molecules not long ago thought to be unique to terminally differentiated muscle cells.

Such results might satisfy the egos of muscle biochemists, but perplex those attempting to understand cell differentiation. Current models assume that the differentiated state is based on the activity of different sets of genes in different kinds of cells. A possible resolution of the dilemma of ubiquitous contractile proteins, and one with considerable theoretical implications for other aspects of differentiation, is the notion that there are several structural genes for different myosins and different tropomyosins, and that in different kinds of cell different myosin and tropomyosin genes are transcribed. Consistent with this scheme is the finding that the myosin light chains and the LMM portion of the myosin rod are products of different structural genes in fast, slow, smooth and cardiac muscles. Possibly during the differentiation of fast muscle, only those structural genes for fast myosin and fast tropomyosin become available for transcription and translation, whereas during the differentiation of platelets or cartilage cells two other sets of genes for myosin and tropomyosin become available. This means that the genes for platelet or cartilage myosins are no more available in skeletal muscle cells than are the genes for albumin or pituitary hormone.

This ready solution, regrettably, is not as likely to explain the role of actin in the developmental programmes of virtually all cells. The issue with this strikingly conservative protein is whether the products of a single structural gene can be coupled to different kinds of myosins and tropomyosins, or whether there are several identical actin genes possibly even in different chromosomes participating in different developmental programmes. Circumstantial evidence for the latter stems from experiments showing that bromodeoxyuridine (BUdR)-suppressed myogenic cells

# If at first you don't succeed . . .

RADIOASTRONOMERS are about to begin another programme of 'listening' for signals from intelligent life within our Galaxy. Since the days of the original Project Ozma a decade and a half ago, radio observing equipment and techniques have improved and the rationale behind such a search has become more sophisticated. Previous efforts chiefly concentrated on hydrogen frequencies, since hydrogen is the most abundant element in the Universe. But recently there has been a growing feeling that any really intelligent race would probably preserve just these frequencies as free from artificial noise, because of their importance to radioastronomers. So the new investigation, which begins on May 8, will be using frequencies appropriate to emission from water.

The rationale behind this is partly the importance of water to life as human beings know it. In the wild, creatures meet at the water hole, so why not try the same sort of thing for contact between ourselves and extraterrestrial creatures? The frequencies are also ones which have been found in natural astronomical sources, notably clouds of gas and dust believed to be associated with young, forming stars. They are not expected to occur naturally in the region of older stars, which improves the likelihood that any such 'signal' from near such a star is a sign of life.

The astronomers responsible for this particular investigation are P. Feldman, of York University, Ontario, and A. Bridle of Queen's University, Kingston, Ontario; their programme involves the 150-foot Algonquin telescope, and is a "passive" one—Bridle is reported as saying that "we would not be capable of sending a signal our own equipment could detect over interstellar distances". Some six stars will be studied intensively from time to time (the first observing period devoted to the programme is 5 days) and 300 to 500 stars will be looked at more briefly over a year or two. The targets have been chosen on the basis that they are non-variable, slowly rotating (and so likely to have planets) and middle-aged (so that intelligence has had time to evolve).

News of this project arouses mixed feelings, since the 150-foot is a valuable instrument that might arguably be used for 'better things'—in the sense of studies which would definitely produce results. But 5 days here and there need be no great loss, and there will, of course, be no quibbling about the project if the North American team hit the jackpot.

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