

## NEWS AND VIEWS

# T-Mycoplasmas and Reproductive Failure

ATTENTION was drawn recently (see *Nature*, **241**, 425 ; 1973) to the significant relationship between maternal infection and foetal loss and morbidity. Rubella, cytomegalic inclusion disease and toxoplasmosis were all cited as causing retardation of human foetal growth and reference was made to further evidence, pointing to the possible implication of Coxsackie viruses in retardation of foetal growth and certain congenital malformations, particularly those affecting the heart. Low birth weight has been attributed to human maternal infection with T-mycoplasmas (Braun and colleagues, *New Engl. J. Med.*, **284**, 167 ; 1971), and these organisms have been isolated from the foetal membranes in cases of repeated abortion (Kundsinn and colleagues, *Science*, **157**, 1573 ; 1967).

Mycoplasmas, which used to be known as pleuropneumonia-like organisms, are the smallest free-living organisms, with similarities to both viruses and bacteria. They resemble viruses in size, and are therefore ultrafiltrable, as well as in having no rigid cell wall. They resemble bacteria in their ability to grow in acellular media ; in their chemical composition which includes both RNA and DNA and in their growth being inhibited by tetracyclines and some other antibiotics which interfere with their metabolism. A feature of the T-strains is their ability to metabolize arginine or urea with the production of ammonia (see *Lancet*, ii, 248 ; 1967). Mycoplasmas have been implicated in a wide variety of human diseases including primary atypical pneumonia (Channock and colleagues, *Proc. US Nat. Acad. Sci.*, **48**, 41 ; 1962), myringitis, otitis media, various rashes, erythema multiforme, the Brodie-Reiter syndrome and, in the case of the T-strain, non-specific urethritis.

On page 120 of this issue of *Nature*, H. Gnarpe and J. Friberg of the University of Uppsala present evidence that T-mycoplasmas may be a possible cause of human reproductive failure. All who have had experience of the diagnosis and treatment of human infertility are well aware of the not infrequent couples who, after full conventional investigation, fail to present any explanation for their continued reproductive failure. Emotional factors, immunological causes and mysterious "infections" are among the possibilities that the groping clinician postulates as a cover-up for his ignorance and his inability to account satisfactorily for the continuing infertility.

It is just such a group of patients that Gnarpe and Friberg have studied, having eliminated the common causes of reproductive failure by conventional clinical investigations. They were able to isolate T-mycoplasmas from 89 per cent of the hundred and four patients (from the seminal fluid of forty-five of the husbands and from the cervical mucus of forty-seven of the wives). By contrast, T-mycoplasmas were isolated from the cervical mucus of only nine of forty pregnant women and from the seminal fluid of six of twenty-three men married to women who were pregnant or who had recently delivered. The difference in the incidence of T-mycoplasmas between the

fertile and infertile patients is highly significant. Treatment with doxycycline was shown to eliminate T-mycoplasmas from all of ten men and nine of eleven women. Within five months of eradication of T-mycoplasmas 29 per cent of the infertile women had conceived, no pregnancies having occurred in a preceding 3-months' period of observation.

These findings are of great interest and would certainly seem to justify the further investigations which the authors are carrying out. Perhaps two comments might be justifiable. In the first place, it is possible that the much lower incidence of T-mycoplasmas found in pregnant women and their husbands could be attributable to the pregnancy—and it should not be difficult to refute this suggestion if untrue. In the second place, the restoration of fertility by treatment could have been more convincingly demonstrated if a double blind trial of therapy had been carried out, because it is not impossible that psychotherapeutic factors may have been involved.

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## Ubiquitous Neutrinos

DURING the past year neutrinos seem to have become a panacea for many of astronomy's ills. So little is known about the physical properties of these elusive particles that, as many astrophysicists (and geophysicists) are coming to realize, the visible manifestations they produce in different models can be adjusted to cover a multitude of sins by suitable tinkering with, for example, the hypothetical mass and equally hypothetical lifetime of the neutrino.

In January last year Bahcall, Cabibbo and Yahil published a discussion of the stability of the neutrino in which they pointed out that "our present knowledge of neutrinos is insufficient to establish whether or not neutrinos are stable" (*Phys. Rev. Lett.*, **28**, 316 ; 1972). The point, of course, is that the very low counting rate reported from solar neutrino detectors implies that neutrinos are very stable particles. If they have finite mass they could be unstable, and Bahcall *et al.* showed that this could still be consistent with the solar neutrino experimental results.

But what is really meant by stability in this case? All that is really "known" from those experiments is that a solar neutrino, with typical energy 1 MeV, lives long enough to travel the distance between the Earth and Sun at the speed of light—that is, for 500 s. But even this evidence could be the result of misinterpreting the data. According to Bahcall *et al.*, standard astrophysical models of the Sun could be incorrect, so that neutrinos are not produced in the amounts predicted. Alternatively, the solar models may be correct, but the neutrinos produced decay before they reach Earth. Either effect could explain