NEWS AND VIEWS

What comes after Fertilization?

TEST tube babies may not be just round the corner, but the day when all the knowledge necessary to produce them will be available may have been brought a stage nearer by the work reported by Dr R. G. Edwards and his colleagues this week (page 632). They have fertilized human egg cells *in vitro*, overcoming the problem of sperm capacitation—how to obtain sperm that are in the right state for fertilization—by using a medium similar to that recently used successfully with hamster sperm.

Oocytes were taken from the follicles of ovaries that had been removed for medical reasons—the chances are that they were in some way abnormal, but that is not a bar to experiments designed simply to demonstrate fertilization. Fluid from the follicles, supplemented when necessary by artificial media, was used to mature the oocytes, so that they were ready for fertilization, having undergone the first cell division of meiosis—a process which usually occurs during the passage down the oviduct. Oocytes and sperm, both ready for fertilization, were mixed together. Phase contrast microscopy showed that sperm often entered oocytes and stimulated the completion of the second division of meiosis. In other words, pronuclei were produced, containing the set of chromosomes which is later extruded as the second polar body—the first polar body is extruded after the first division of meiosis. Evidence that sperm had entered oocytes was taken as evidence that fertilization had taken place.

Now that human oocytes can be fertilized *in vitro*, the obvious next step is to culture them to the blastocyst stage, as has already been achieved with the mouse and is likely soon with the rabbit. These different species apparently have fairly similar requirements when it comes to culturing their embryos *in vitro*. The blastocyst is the product of cleavage division of the fertilized oocyte, or zygote, and in the human it is about 200 microns in diameter, and is the stage of development reached after three or four days of pregnancy. As Dr Edwards and his colleagues say, there are likely to be problems when this sort of embryonic development is attempted *in vitro*. At the moment there seems to be a strong likelihood that abnormal embryos would develop, and there can be no question of going on to the blastocyst stage until the techniques and the medium required for fertilization have been perfected. Some of the problems may be solved when the conditions necessary for the maturation of the oocytes are better understood.

If healthy blastocysts are to be produced, oocytes will have to be taken from healthy ovaries, and Drs Edwards and Steptoe are now working on ways of achieving this by using the technique of laparotomy—surgical incision of the wall of the abdomen. They are now able to take oocytes straight out of the abdomen, and when these methods have been perfected, and all the other problems solved, there should be nothing to prevent the culture of human embryos *in vitro* up to the blastocyst stage, and maybe further with some more refinements of technique. The medium that has been developed for fertilization is likely to be suitable for culturing more advanced embryos. But Dr Edwards and his colleagues are interested in the blastocysts.

The advantage of having these blastocysts in culture will be that it will then be possible to make a thorough study of the early stages of human embryology, for example to find out when different enzymes become active. There will be the opportunity to investigate the nature and time of onset of various biochemical abnormalities which are now attracting considerable attention in the medical world. So little is known about the vital early stage of human embryology that any efforts that are likely to lead to an increase in knowledge are surely praiseworthy. Any research that may help to show why embryonic development sometimes goes wrong seems to be a laudable enterprise. The fact that the techniques might one day be developed to make it possible to produce a fully grown human embryo *extra utero* should not be a restraint to progress. The day of the test tube baby is not here yet, and the advantages of this work are clear. These are not perverted men in white coats doing nasty experiments on human beings, but reasonable scientists carrying out perfectly justifiable research. One of the possible benefits of this research could be the treatment of some forms of infertility, probably in older women, who are thought to produce a high proportion of abnormal embryos which fail to develop.

But because the virtues of work like this seem self-evident to those most immediately involved, they should not fall into the trap of believing that everybody else feels the same. There is, for work like this, a real need to explain that the purposes of scientists are very different from those of Big Brother in George Orwell's 1984. Unless this is done, there is a danger that the public may come to lose faith in science.

MICROBIOLOGY

Measles and Mental Ability

from our Microbiology Correspondent

MEASLES, that ubiquitous disease of childhood, is usually considered to be quite harmless to subsequent welfare unless encephalitic development ensues. Fortunately the latter condition is rare. But there have been several reports that uncomplicated measles can be detrimental to the central nervous system. Unfortunately the two most important studies designed to test the correlation between measles and mental debilitation (Abruzzi, *J. Pediat.*, **64**, 750; 1964, and Douglas, *Brit. Med. J.*, **2**, 1301; 1964) reached opposing conclusions. Recently a carefully planned and compre-