

begins to cleave into two, four and eight equal cells which do not separate, but remain yoked together to form a zygote. The zygote continues cleaving until it reaches the stage of a mulberry-like ball (morula). On day four after fertilization the morula is gently pushed into the uterine cavity to land in a new 'culture medium' supplied by the glands of the uterine mucosa in the secretory phase of its monthly cycle. Here dramatic changes occur. Fluid enters the solid ball of 64 to 128 equal blast cells (from the Greek *blastos* meaning bud or stem) thus inducing their differentiation into two cell groups of quite different properties and potentials. The large outer cell mass is called trophoblast (from the Greek *trophikos* meaning nourishment), and these overactive cells will form a nourishing chorion (later placenta). The tiny inner cell mass is called an embryoblast because the cells are the potential bud cells of a future embryo. The potential embryo may never come into existence unless the rapidly dividing trophoblast invades the uterine mucosa, erodes the blood vessels of the deeper layers and embeds the whole blastocyst in the uterine wall. Only after successful implantation has secured a constant supply of maternal blood will the embryoblast come to life and begin to lay down the three primordial germ cell layers — ectoderm, endoderm and mesoderm — from which all the tissues and organs of an embryo will arise.

This creation of the human embryo by blastocyst differentiation and implantation, during the second week, has been completely ignored in discussions on *in vitro* fertilization. The world's leading experts on this topic, at their meeting at Bourn Hall,¹ discussed 'Embryonic culture *in vitro*', 'Embryonic growth *in vitro*', 'Replacement of cleaving embryos' and 'Implantation of embryos'. At the meeting it was claimed: 'We have grown some embryos to blastocysts at five days of growth, before replacing them in the mother'.¹ The *in vitro* fertilization technique was explained to general practitioners,² by describing 'the implantation of the fetus' via a cannula passed through the cervix into the uterus, adding the information that 'the fetus is usually at the eight-cell blastula stage'. Another expert³ considered the 'transfer of cleaving embryos into the uterus'. Microphotographs were shown with the caption: 'The dividing embryo at the two-, four- and eight-cell stages'.³ No wonder that Enoch Powell was quoted as protesting against 'fertilization of a human embryo outside the womb'.⁴

The sloppy use of embryological terms

not only misled the public into believing that 'little human beings' were maltreated in test tubes, it misled the experts themselves into false interpretations of their work and erroneous claims about its prospects. I suggest that in future debates, in the media or the House of Lords, the unjustified claims of tissue culture workers be rejected on scientific grounds before appealing to moral convictions.

I suggest that the case for studying embryos *in vitro* and of obtaining their parts through an open glass window is closed and can be dismissed as pure science fiction. Cells of the embryo proper are first recognizable at the beginning of the third week, that is at a time when *in vivo* implantation of the blastocyst has been successfully completed. *In vitro* implantation of the blastocyst would imply malignant trophoblast invasion of a glass wall.

I also suggest that keeping pluripotential blast cells in tissue culture for more than five days is a sure way of producing pathological structures, such as disorganized, and possibly malignant, blast cell masses with faulty differentiation and bizarre pattern formation.⁵

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Doctors and nuclear war

Sir,

General practitioners are becoming increasingly concerned about progressively rising arms expenditure at the expense of health needs. Nationally, there is increasing difficulty in providing even basic medical services as a result of lengthening inpatient and outpatient hospital waiting lists, inadequate cervical cytology and breast screening services and financial constraints on neonatal care and renal dialysis programmes. As a nation, the UK spends proportionately less on its health services than other European countries, and, according to a Government white paper, National Health Service funding as

a proportion of gross national product will actually fall in 1986, 1987 and 1988.

Planned Government expenditure of over £10 billion on the Trident weapon system over the next few years can only compound the increasing difficulties of providing adequate health care. Statistically, there is an inverse relationship between arms expenditure and health indices. There is already clear evidence that Third World countries which have reduced arms spending show a corresponding improvement in health. Medical Campaign Against Nuclear Weapons, in its forthcoming campaign, 'Treatment not Trident', plans to increase public awareness of the direct connection between increased arms spending and deteriorating health standards, and to encourage diversion of UK Government spending from arms to health. This is in keeping with the British Medical Association's policy.

It is hoped that general practitioners, with their special concerns for patients' health and welfare, will lend their active support to the campaign.

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Sir,

Dr Holden writes in his letter (October *Journal*, p.497) that the College's refusal to commit itself in favour of his solution to the dilemma of the prevention of war in any form is shameful.

Although the views of Dr Holden and his colleagues in the Medical Campaign Against Nuclear Weapons are indeed one solution to a very complex political problem, they are held neither by the country at large nor by all of their colleagues, as evidenced by the ballot box and by opinion polls.

It would therefore be invidious for the Royal College of General Practitioners to align itself with this particular pressure group, no matter how praiseworthy their intentions. Council are to be congratulated on their excellent and balanced response to this attempt to involve them in the political field, and I hope that they will continue with this attitude in the future.

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