

he and his colleagues in Canberra had discovered new chemical reactions for extracting and refining copper, and applied for patents in twenty-nine countries for them. If successfully developed to a commercial stage, these reactions could replace the conventional pyrometallurgical process which consumes twice as much energy and emits noxious sulphur dioxide as a byproduct.

In the hydrometallurgical process crude cuprous sulphide is dissolved in an acetonitrile/water solution. On distilling off the acetonitrile, the cuprous ions disproportionate into pure copper, which is precipitated, and cupric ions, which take part in the first reaction. Pure sulphur, rather than sulphur dioxide, is a byproduct. Dr Parker claimed that a practical process developed from these reactions would be rapid, cheap and environmentally clean. It awaits the development of a pilot plant, and to encourage industry to undertake this and to handle patents, the ANU has formed a company ANUMIN.

CONTRACEPTIVE PILL

Link with Thrombosis

from a Correspondent

It is well recognized that the contraceptive pill should not be used by certain women, for example those with a history of thrombosis, diabetes, liver diseases and raised blood pressure. There has not been such strong evidence for a link between heart attacks in young women and the pill, but several reports have suggested that a link may exist. Radford and Oliver have now published further work which strongly suggests that the pill may be a cause of ischaemic heart disease in young women (*Brit. med. J.*, 3, 428; 1973).

The evidence comes from a comparison of the usage of the pill in young women with heart disease with that in the general population. Admissions to the coronary care unit of the Royal Infirmary of Edinburgh were studied over a three-year period and twenty-two women aged between thirty-one and forty-five were diagnosed clinically and biochemically as having had a coronary thrombosis. Six of these (27%) had been taking the pill at or just before the occurrence of the attack, and of the nine in the age group thirty-one to forty, in which coronary thrombosis in women is a fairly rare occurrence, five had been taking the pill (55%).

This compares with figures from various studies which indicate the usage of the pill in the general population to be between 13 and 17%. But most users are below the age of thirty, and the authors estimate a usage rate of 8.3% in women aged between thirty and forty-five and 10.8% in women aged thirty to thirty-nine. So Radford and Oliver

say that the figures which they obtained for the proportion of pill-takers among the women admitted with thrombosis—27% and 55% in the two age groups—are significantly greater than expected.

The main thrust of the article, however, is to support the view that women who already have any likelihood of developing coronary thrombosis are best advised not to take the pill. The authors found that each patient had at least one factor recognized as predisposing them to coronary thrombosis, and the average number of factors was 2.6. Some of these factors, such as increased blood pressure and obesity, can be easily checked in a routine examination, but some of the other factors, raised serum cholesterol levels for example, are not normally looked for in the routine examination which precedes a prescription for the pill. So one of the recommendations that follows from this work is that these more sophisticated tests should be carried out in prospective users of the pill with a family history of coronary thrombosis occurring at an early age.

One curious finding was that of the four women between thirty-one and forty not on the pill yet who developed

coronary thrombosis, three had been sterilized. Removal of the ovaries is known to affect blood cholesterol levels, but in these three cases the ovaries were intact, sterilization having been effected by removal or ligation of the Fallopian tubes. Two of these women had no known risk factor for coronary thrombosis. As the authors point out, this association between sterilization and coronary thrombosis may well be a chance finding. But as sterilization is sometimes recommended as an alternative to the pill for women seemingly at risk from coronary thrombosis, this finding deserves further investigation.

PROTONS

300 GeV Disappoints

from a Correspondent

WITH the first of the very high energy proton synchrotrons coming into operation at the National Accelerator Laboratory, near Chicago, it would be surprising if nuclear physicists were not in for some surprises. Naturally the main interest is the study of the interactions and properties of elementary

Decoordination of RNA and Protein Synthesis

In *Nature New Biology* next Wednesday (September 12) Foury and Goffeau show that RNA synthesis in yeast, like that in bacteria, responds to inhibitors of protein synthesis. In yeast cycloheximide, among other antibiotics, specifically inhibits protein synthesis; chloramphenicol achieves a similar inhibition of protein synthesis in bacteria. Normally, when growth is restricted in the case of both microorganisms (this may be achieved in a number of ways, for example, deprivation of an energy or nitrogen source) RNA synthesis is reduced. Conversely, in normal growth conditions, the inhibition of protein synthesis with the appropriate antibiotics in yeast, as in bacteria, likewise depresses RNA synthesis.

A combination of the two types of "inhibitory" conditions, however, in both yeast and bacteria, leads to a stimulation of RNA synthesis. The authors show that the apparent increase of RNA synthesis in yeast is not due to increased cellular permeability to the relevant metabolites or decreased RNA degradation.

The mechanism responsible for the increase in RNA synthesis is well understood in the case of bacteria. Stress conditions lead to an accumulation, dependent on protein synthesis, of guanosine tetra- and pentaphosphate

(inhibitors of RNA synthesis). Inhibition of protein synthesis is accompanied by a fall in the cellular concentration of the inhibitors of RNA synthesis and a consequent increase in the level of RNA synthesis.

The similarity in the effects of cycloheximide in yeast and chloramphenicol in bacteria suggests that the downshift conditions might produce the accumulation of an inhibitor of protein synthesis like ppGpp in yeast, but this particular substance has not been detected in eukaryotic cells. An alternative possibility is that cycloheximide stimulates the production of a positive control agent in yeast, for example, cyclic AMP, which is known to stimulate RNA synthesis in shutdown conditions in yeast. The relation, however, between the effects of cyclic AMP and cycloheximide remains speculative.

The common denominator in prokaryotes and eukaryotes seems to be a protein, most likely an enzyme, which is turned over rapidly in the cell (and therefore disappears quickly in the presence of a protein synthesis inhibitor), and which is responsible for either synthesis of a low molecular weight substance that negatively controls RNA synthesis (in prokaryotes) or degradation of a low molecular weight substance involved in positive regulation (eukaryotes?).