In this issue

Water tunnel — An indispensable tool

The high-speed water tunnel at the Indian Institute of Science in Bangalore (**page 779**) is being routinely used for basic and applied research by major institutions in India. An important aspect of the water tunnel is that some of the physical properties of water that differ considerably from those of air can be exploited to the maximum extent. For example, for a given size of test section of tunnel and velocity of water in the test section, the Reynolds number in water flow can be 15 times that in the corresponding air flow. Again, for a given velocity, the magnitude of the dynamic head in water flow can be 800 times that in the corresponding air flow. This makes the measurement of the turbulent pressure fluctuations an easy task in water medium than in air. Further, as the refractive index of water is a very sensitive function of temperature, it can be effectively used for optical visualization of flow by shadowgraph, schlieren photography or interferometric methods.

Water tunnels are used for the study of various aspects of hydrodynamic flow around solid bodies. They have become indispensable in the study of cavitation, to conduct model studies to generate scaling laws to extrapolate model-test results to prototype conditions, etc. These studies are expected to play an ever increasing role in evolving accurate design of components, particularly those which would be less prone to cavitation under otherwise identical operating conditions.

The drug debate

The drug RU 486 (see **page 776**) acts as an abortifacient by blocking the action of the hormone progesterone. Deprived of this hormone the uterus expels the embryo. Studies have shown that RU 486 is successful as an aborting agent in 95% of cases when administered within nine weeks of conception. The question arises whether India, with its population problem, should get involved in the testing of this drug. In the developing world surgical procedures are now being used for abortion and the risks are high. Therefore the use of RU 486 could possibly make a major contribution towards reducing abortion-related morbidity and mortality. From the literature it seems that termination of pregnancy with RU 486 may not just be a question of purchasing it in a store and taking it in the privacy of a home. It may require medical supervision not only for monitoring the success of the procedure but also to study any side effects that may arise. Therefore one can think of an outpatient treatment, which may be successful in 95% of cases. The advantage of this would be that facilities and skilled personnel would be necessary for only the remaining 5%.

WHO has said the developer of the drug promised to make it available to any member country of the WHO on request for further studies. China appears to be the only country besides France to have approved the drug for use as an abortifacient.

The drug also seems to be potentially promising for easing difficult births, for contraception, for treating tumours that thrive on progesterone and the rare but life-threatening Cushing's disease.

US scientists are following up European findings on RU 486's use in treating breast cancer patients. But if the anti-abortion lobby in the US has its say, use of the drug in breast cancer therapy may also be prevented.

Pesticide production — the safe way

The tragic Bhopal gas tragedy in 1984 in which more than 3000 people died was the result of the escape of large volumes of methylisocyanate (MIC). In the Union Carbide pesticide plant in Bhopal, as in many others, the MIC was reacted with 1- naphthol to produce carbaryl. The production of carbamate pesticides by this process has now been prohibited in India. Another process, which uses phosgene instead of MIC, is also greatly frowned upon by environmentalists throughout the world. The National Chemical Laboratory in Pune has now developed a process which uses neither MIC nor phosgene (**page 775**).