

Pull of the Atom

THE First International Conference on the Peaceful Uses of Atomic Energy in 1955 was the largest meeting that had been convened under the auspices of the United Nations till then, with 1,428 participants representing 38 Governments. The Second Conference was even bigger, with 2,692 delegates from 46 countries. And now the Third Conference is the biggest ever, with 3,000 scientists participating. Such is the pull of the atom!

For such large conclaves, normally disputatious minds, the degree of unanimity achieved at these conferences is remarkable. The principal preoccupation of the assembly is invariably with establishing that atomic power can be economically competitive with power from conventional sources. This problem obsesses not only scientists from Westinghouse or General Electric who are out hawking reactors, but also scientists from the so-called developing countries. This is not so difficult to understand since some of them have already persuaded their Governments to go in for an atomic power station or two and the others hope to do so in the near future. India's Bhabha has a paper at the latest Conference showing that whereas it will cost coal-fired stations in Bombay 4.1 paise to produce a kwh of power, the comparable cost of power from a nuclear station will be only 2.6 paise. *Quod erat demonstrandum!*

The first decade of nuclear power opened with many alternative possibilities in the choice of nuclear systems; it now closes with two main lines of development—boiling water reactors and gas-graphite reactors—well established and many interesting possibilities under study. The water systems, developed in the United States, use enriched fuel and are smaller and lower in capital cost than the gas-graphite systems, developed in the U K, but the fuel costs are higher. But even among the boiling water types, the economies of scale are pronounced. Earlier ideas of compact and economical reactors in the 30 mW to 50 mW range have had to be regretfully abandoned. Reactors of 500 mW or more are now considered the most economical, though there are not many power systems which can accommodate such a station.

It is, of course, a fact that nuclear power costs have been progressively

reduced, though perhaps no nuclear power station exists just yet which can claim to produce power cheaper than conventional stations. But atomic scientists are more confident than ever that the "break-even" point will come—exactly when, it is difficult to forecast. The first half of the decade saw brave efforts at line calculations to

determine the "cross-over points" (the time when nuclear power would become cheaper than conventional) by extrapolating from slender data. It is only now that firm cost data are beginning to emerge, mainly on capital costs, though much more information now exists also on operating costs. However, many unknowns remain, among them the life of the station, the future costs of nuclear fuel, future credit for irradiated fuel, etc.



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