television stations. But the IBA plans to use the money itself to smooth over any inconsistencies in quality in the radio system and in particular it hopes to sponsor live performances of music. It will then be in the position of foisting balance and culture upon the stations when it should be developing the means of demanding that they produce it themselves.

Systems Analysis

THE announcement from the Royal Society and eleven other national academies of science that there is to be an International Institute of Applied Systems Analysis at Vienna (see page 361) does at least resolve the question that has perplexed those working in this and related fields since 1968, when the institute was first proposed—will it ever see the light of day? The answer is yes. The fact that the Soviet Academy of Sciences has in the last resort come forward not merely with enthusiasm but with the offer of $1 million a year towards the budget has no doubt helped to decide the issue. In other international organizations, those linked with the United Nations for example, the Soviet government is usually unwilling to match the contributions of the United States as it has done on this occasion. And given the decision that the institute should be set up, it is of course entirely proper that it should be sited in Vienna, that there should be a director from the United States and that his deputy should be a Russian. Such difficulties as there are stem almost entirely from questions about the function of the new organization. What tasks will the international institute tackle, how well grounded will be its data? How relevant will be its analyses to contemporary problems?

The techniques of objective systems analysis must in due course have an important contribution to make to the understanding of society. The idea is that the parameters which describe the condition of society at any time may be likened to those describing the state of a political system, from which it would appear to follow that the evolution of a social system can be calculated once the starting conditions have been specified and that the effects of external changes, deliberate or otherwise, can be calculated. This, in a crude fashion, is what the Club of Rome's computer study of the whole world has attempted in *The Limits to Growth*. It is, however, plain that there are many ways in which the analysis of social systems is more complicated and necessarily more uncertain than the analysis of physical systems, where the relationships between one parameter and another can often be derived analytically from physical laws. In the more complicated real world, as those who have tried to apply systems analysis to national economies have discovered, the relationships between variables, if known at all, are at best empirical and often unpredictably dependent on unquantifiable attributes of the condition of society such as what is known as business confidence or the political mood of a nation. It follows that one of the methodological issues that must be central to the work of the International Institute of Applied Systems Analysis is the identification of those relationships which are so unsure that the applicability of the technique must itself be doubtful. The difficulty is that this is a task in which social scientists have as big a part to play as systems analysts pure and simple.

A second more practical difficulty is that of knowing where to start. This week's announcement says that the institute may well attempt to cut its teeth on a study of the evolution of the supply and the demand for energy in the years ahead. In the past few months, this has been a widespread preoccupation, especially in the United States where the Ford Foundation has set up a task force to make a study of the domestic problem. Even in this apparently quantifiable field, however, there are serious problems to watch out for. It may seem comparatively easy to relate the demand for energy with various indices of output by the manufacturing industries, but experience in countries such as Britain in recent years shows how difficult even such a limited task may be—in the 1960s, increases of efficiency in the use of energy (as well as a slackening of the pace of growth in manufacturing industry) conspired to undercut forward estimates of energy demand. There are bound also to be immense uncertainties about the future price of fuels of various kinds. In the petroleum market, for example, calculations of the relationship between the continued exploitation of known reserves and the market price, theoretically quite possible, are likely to be overridden by non-technical considerations such as the determination of the OPEC countries to put up their price. In much the same way, prices in the uranium market may depend critically on the speed with which fast reactors are brought into service—the slower, the greater will be the demand for natural uranium in the 1980s. It follows that the contribution of the International Institute of Applied Systems Analysis to a better understanding of the problem of energy supply and demand in the world as a whole may consist chiefly of a statement of the uncertainties with which calculations like these are necessarily plagued. That, if done properly, will be a public service and a spur to further understanding but not, at least, in the popular sense, a solution to any problem.

100 Years Ago

AT the last meeting of the Council of the Pharmaceutical Society, it was resolved unanimously that the resolution passed in 1862, prohibiting ladies from attending the lectures, be rescinded, and that ladies be admitted as students to the lecture classes of the Society. At present but one lady has taken advantage of the privilege offered; but as soon as the resolution becomes more widely known it is probable that the liberality of the Society will be recognised by ladies, who will avail themselves of this excellent opportunity of studying practical chemistry and botany. The lectures on chemistry are by Prof. Redwood; those on botany by Prof. Bentley, commencing early in October. The chemical lectures are continued three days a week until the end of July; the botanical lectures, lasting for the same period, being delivered on two days in the week. During the summer months they are delivered in the Botanical Gardens, Regent's Park.

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