

2000. Contributions to the Study Group's discussion from the wider chemical community would be welcomed.

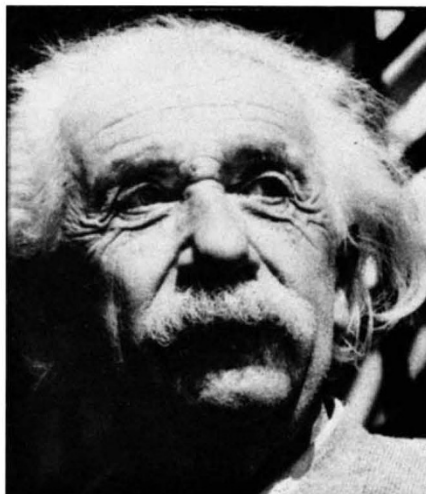
The Study Group's first concern was to assess the possibilities for the fixation of atmospheric carbon dioxide. There was general agreement that emphasis on a biological photosynthesis would be justified, the photochemical synthesis, perhaps metal-catalysed, of organic molecules such as methanol or formic acid appearing to be a challenging and reasonable objective. Indeed much more knowledge generally of the photochemistry of related simple systems, such as the carbonate ion, is needed. The organometallic chemistry of carbon dioxide was discussed at some length and it was recognised that there had been little work directly related to this area; the Study Group's view might be summarised by saying that, although much would accrue in the general field of synthesis, it was not obvious at this time that homogeneous catalytic fixation of carbon dioxide was either technically feasible or economically viable. New developments of heterogeneous catalytic alloys could aid the separation and fixation of atmospheric carbon dioxide but an alternative technology based on molecular sieves appeared to be economically unattractive. It appeared that a single step conversion of methane to higher hydrocarbons or to higher alcohols would be of considerable interest to industry in the short term.

It was accepted that the further development of photovoltaic and photogalvanic cells should be of high priority and that the latter have potential for energy storage. The development of efficient fuel cells, similarly, is of importance but, in view of the heavy industrial investment in this area, SRC's interest should be restricted to well-defined new ideas such as alternatives to platinum electrodes. The low (about 80° C) temperature storage of hydrogen by both organic and inorganic systems emerged from the discussion as a promising area of enquiry while coordination of organic synthetic methods with solid state physics could provide new approaches to the development of the very elusive high temperature superconductor.

The Study Group emphasised that overdependence on nuclear energy for future needs, without heavy investment in research devoted to the utilisation of solar energy, could be hazardous. Of course, heavy investment in new research in these areas will require examination of the technological economics in relation to possible alternative methods. The Study Group will meet again to review any changes in the pattern of research activity and development which might originate from the chemical community as a whole."

Physicist, heal thyself

Michael Stone, East Berlin.



Albert Einstein

THE mind boggles at the idea of an opera about somebody as unobtrusive and, generally, devoid of drama as Albert Einstein. The man acknowledged as this century's greatest scientist may have wrought a revolution in modern physics and astronomy, he may have shared responsibility for the development of nuclear research, but his own life was singularly free of anything approaching the sensational. His only personal experience of something nasty happened in 1933, when his books were among those burnt on Goebbels's orders and some Nazis wrecked his study in Berlin. Soon after, he emigrated to the United States where at Princeton University, he continued his studies. In August 1939 he wrote his famous letter to President Roosevelt which is said to have initiated the American nuclear research programme.

In East Germany, where "Einstein" has just had its world première at the Deutsche Staatsoper, mathematics are regarded as almost an Olympic discipline, with annual regional and national competitions, culminating in mathematical championships at different age levels throughout the Socialist countries. Fortunately for the rest of us Paul Dessau and his librettist, Karl Mickel, were more interested in the conscience of Albert Einstein and the success or failure of his endeavours as a pacifist and humanist. Dessau—for many years Bertolt Brecht's closest musical collaborator and friend—combined this subject with an ambition to revive the traditions of the popular musical theatre, from which have sprung such comic figures as the Shakespearean

fool, the harlequin, and Papageno. So he embedded the three acts showing up the relationship between politics and science—first in Nazi Germany, later in the United States—in a comic opera frame, with a prologue, two intermezzi and an epilogue.

Hans Wurst, a traditional comic character in Germany, makes a brief appearance to introduce the opera's basic idea: since science depends upon those in power, scientists ought to develop a social consciousness to make sure that their work serves humanity. In the first entracte, Hans Wurst, (which means as much as Jack Sausage) is thrown to a huge crocodile, symbolising Nazi Germany, but manages to save himself by the expedient of telling the beast a joke until outsize tears of laughter roll out of its eyes. The same trick does not seem to work during the second intermezzo—the crocodile now stands for the America of President Truman and Senator McCarthy—and he is gobbled up. In the end, a resurrected Hans Wurst balances delicately along the edge of an enormous razor, telling us how much he enjoys being alive.

In between such shenanigans we are treated to a semi-historical essay on the role of Einstein and other scientists under Hitler and in the US, the conclusion of which is that Einstein destroys his latest findings to prevent them being misused as, in his opinion, the discovery of nuclear fission had been perverted to blot out Hiroshima.

If this sounds like dry stuff, it isn't. Dessau is a fox who knows exactly how to garnish his score with musical titbits—here a melodious quote from Bach's Toccata, there a series of percussion effects—so that the ear craves for more. The singing is recitative rather than arioso, the orchestra relies more on the brass and the woodwinds, while the strings function mainly in parody; another pointer to Dessau's critical detachment towards the hero of his opera: Einstein was a lover of the violin.

In her production, Ruth Berghaus's scenic humour—she is Paul Dessau's wife and succeeded Helene Weigel as head of the Berliner Ensemble—well matches her husband's playfulness. In the sets of Andreas Reinhardt she provided Theo Adam (looking quite astonishingly like Einstein himself), Peter Schreier, and Reiner Süss (as two other physicists, one of whom makes his peace with the Nazis, while the other lands in gaol) with ever new stage arrangements, ensuring a pace and a high level of acting.

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