

Science and the humanities

the lifetime of a 2 MeV mass, 200 GeV energy particle is increased 100,000-fold.

The target calorimeter also has to be as short as possible. It uses tungsten plates instrumented with scintillating fibre ribbons, 200 microns thick (May issue, page 29) for frequent sampling, but with the sampling material comprising only 6% of the total thickness. Downstream, a simple neutral decay spectrometer is followed by a trigger calorimeter. The target and trigger calorimeters were in place for the test run, but not the spectrometer.

In August 1603, Federico Cesi, from a wealthy Umbrian family, and three companions founded 'l'Accademia dei Lincei' (lynx) to discover and investigate the 'great theatre of Nature'. After a demise in 1651, the present National Academy was set up in 1874, and has gone on to

play an important role in fostering philosophy and philology in Italy, work which has gone on to leave its mark further afield.

After having been on view at several venues in Italy, an exhibition 'Federico Cesi and the Foundation of the Accademia dei Lincei',

ISTORIA E DIMOSTRAZIONI INTORNO ALLE MACCHIE SOLARI E LORO ACCIDENTI

COMPRESSE IN TRE LETTERE SCRITTE
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CONSIGLIERO DI SVA MAESTA CESAREA

DAL SIGNOR

GALILEO GALILEI LINCEO

Nobil Fiorentino, Filosofo, e Matematico Primario del Sereniss.

D. COSIMO II. GRAN DVCA DI TOSCANA.

Si aggiungono nel fine le Lettere, e Disquisizioni del finto Apelle.



Galileo's first paper for the Accademia dei Lincei (1613).

Robert Wilson – 'where there is beauty, there is humanness'.



was mounted, for the first time outside Italy, at CERN in May. Reflecting the basic inspiration common to all human endeavour to extend knowledge, the exhibition was marked also by a Symposium on the Unity and Internationalism of the Sciences and the Humanities, sponsored by the CERN Science and Society Seminar and the Istituto Italiano per gli Studi Filosofici, and in cooperation with the CERN Staff Association.

Speakers, drawn from a wide cross-section of disciplines, paused for a moment from their everyday researches and gave their views on the basic unity of the quest for knowledge, and its consequences, intellectual internationalism and the resultant worldwide relationships of understanding and cooperation.

Lincei Vice-President Edoardo Amaldi chaired and first day's proceedings, and Giovanni Pugliese Carratelli, Director of the Istituto

Italiano per gli Studi Filosofici, Naples, introduced the session by pointing out the common roots of intellectual disciplines – the 'search for truth' – characterized by different research techniques.

Sculptor, architect and former Fermilab Director Robert Wilson stressed the human qualities that top flight science brings. Although 'no flower blooms and no birds sing' in physics, the research brings a whole emotional spectrum 'passion, heartbreak, jealousy, ecstasy,...'. Beauty is embodied in the laws of physics – 'like poems' – while symmetry has equal appeal for scientist and artist alike.

Wilson emphasized the usefulness of popular science for bridging the gap between the initiated and the profane, and advocated increased cross-disciplinary contact in universities.

Former CERN Research Director General Leon Van Hove ('From Cosmology to Particle Physics') showed how the laws of physics hold good from the largest scales (10^{36} cm) to the smallest (10^{-17} cm), the span having been extended by a factor of 10^{14} on either side in the last century from the classical 'beautifully austere' Newtonian picture of gravity.

Van Hove showed how the observations of last year's supernova dramatically illustrated the interplay of gravitation with the weak and strong nuclear forces, demonstrating the complementarity of the different forces at work in Nature, and providing a new astronomical window on bulk nuclear effects.

The second day's session, chaired by Olivier Reverdin of the University of Geneva, began with Remo Bodei of Pisa examining the contemporary philosophical view of cross-disciplinary reasoning. 'Philosophy is no longer queen of the

René Thom – 'hard' and 'soft' sciences



sciences,' he claimed. While inheriting much 'moribund' knowledge, philosophical approaches can still help clarify concepts, adding cohesion and bite.

René Thom, pioneer of catastrophe theory, illustrated the inherent differences between 'hard' sciences with exact laws and 'soft' descriptive sciences. The rift between mathematics and everyday language is a corollary, and ways of bridging this descriptive gap would help in the drive to make the world more intelligible.

Girolamo Controneo of Messina ('The relation between philosophy and human sciences') looked at the sociological prerequisites for new theories, and examined the dichotomy between the speculative and scientific approaches which seems to characterize modern culture.

Manfred Eigen of the Max Planck Institute for Biophysical Chemistry in Göttingen focused on the inter-

People and things

Manfred Eigen – the physics of biology



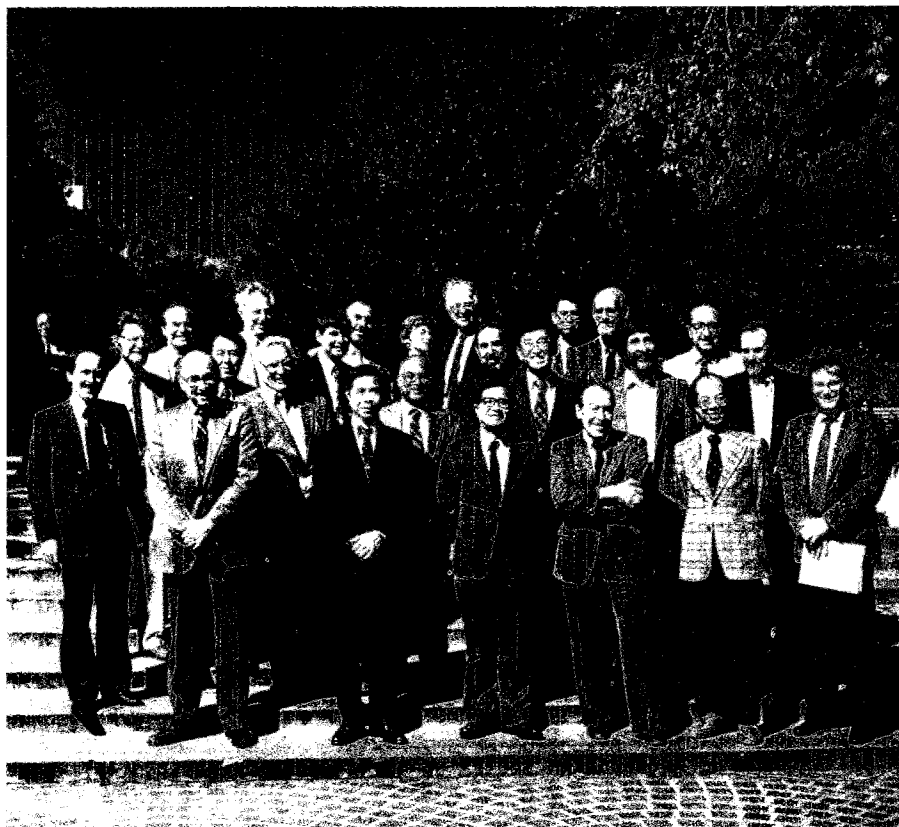
face between chemistry and biology, showing how certain hydrogen bonding (complementary base pairing) marks the threshold where molecules can be regarded as truly 'biological' rather than inertly chemical.

He described vivid simulations of cell reproduction which show how the 'error rate' of cell mutation compounds to produce new effects – evolution – in a way very reminiscent of phase changes in physical chemistry. At a certain stage, the information held in the cells 'melts', and new mutants emerge ('survival of the fittest').

During the two days of the symposium, many deep and thought-provoking ideas were aired, and

will be available to a wider audience with the publication of the proceedings. 'We have planted some trees,' said Ugo Amaldi, one of the prime movers behind the symposium, 'others will have to be added to make a real forest.'

A recent symposium at the University of California at Los Angeles marked the 70th birthday of Julian Schwinger (third from right, front row).



On people

On 15 May, Carlo Rubbia, Physics Nobel Prizewinner with Simon van der Meer in 1984, Director-General-Designate of CERN and Higgins Professor of Physics at Harvard, received the degree of Doctor of Science, honoris causa, from Boston University.

On 12 April Dubna's scientific community celebrated the 75th birthday of eminent Soviet scientist Venedikt Petrovich Dzhelepov. He was among the leading organizers of the Soviet national high energy physics centre which grew into Dubna's International Joint Institute for Nuclear Research, where he has been Director of the Laboratory of Nuclear Problems since 1956.