recent years between the proponents of culture and counter-culture has often tended to focus on science as the chief target for criticism from all sides. This issue was at the centre of the public exchange of views organised in 1974 for the tenth Lustrum of the Catholic University of Nijmegen, in the Netherlands. Five of the papers presented on this occasion have now been published: a general introduction by Professor Desaur (Nijmegen); an indictment of science on 13 different counts by Dr Arne Naess (Oslo); an autopsy of the education system—"the school is dead"—in the context of world wide transformation of culture by Dr Everett Reimer (Puerto-Rico); a defence of science against indiscriminate rejection which often chooses to ignore uncomfortable facts rather than learn to live with them, by Professor Eysenck (London); a reflection on the place of the Catholic university between culture and counter-culture by Professor Van Melsen (Nijmegen).

Critics of an enterprise such as science which exerts enormous influence on all aspects of society can always find something on to which they can latch. Defenders, on the other hand, can be quick to point out the undeniable benefits arising from scientific research; as a last resort, they can even denounce technology as a monster bred by the power structure —but for which scientists themselves will not claim responsibility, their concern being the quest for knowledge, and the quest for knowledge only.

When conducted on this level—which is more or less that of the papers presented here—the debate on the pros and cons of science is never-ending and inconclusive. It is true that each society has the science it deserves, and not surprising that "science has become the whipping-boy" (Eysenck) of those who are most critical of a society which has founded wealth and might on the exploitation of knowledge. Certainly, not all scientists have been indiscriminate and uncritical servants of that State, but most have.

The debate between culture and counter-culture seems at times merely to reformulate some of the fundamental issues discussed by C. P. Snow many years ago: why do we have two cultures—stemming from the natural sciences on the one hand and from the humanities and social sciences on the other—apparently incapable of nourishing each other? Why is it that the scientific establishment sometimes presents the appearance of a new theocracy? Why has the scientific enterprise tended to become an element of consolidation of the *status quo*, rather than an instrument of change?

These questions remain unanswered.

Georges Ferné

Source of meteorite material

Meteor trail (Great Bolide), Courtesy RAS

Carbonaceous Meteorites. (Developments in Solar System and Space Science, vol. 1.) By Bartholomew Nagy. Pp. xiv+747. (Elsevier Scientific: Amsterdam, Oxford and New York, 1975.) Dfl. 210; $30.95.

RETURNED lunar material apart, carbonaceous meterorites have received more intensive study per available unit mass than any other natural assemblage of minerals. The unique characteristics of carbonaceous meteorites marked them out from all other types of meteorite as soon as detailed studies began in the 19th century. The French chemist, Berzelius, examined the Alais fall—the first carbonaceous meteorite to be recognised—and reported: "These stones are different from all other meteorites because they look like solidified clay and because when they are placed in water they disintegrate and give off a clay-like odour."

Dr Nagy includes Berzelius' report, along with several other early accounts of carbonaceous meteorites (one unfortunately dated 1984), in his lengthy and detailed survey of these objects. The report continues: "The question arose in my mind, does this carbonaceous earth contain humus or a trace of other organic substances? Could this give a hint to the presence of organic formations on other planets?" We have here, at the beginning of work on carbonaceous meteorites, a statement of one of the major reasons for the concentration of attention on them during recent years. They pose the question of whether any of the carbon compounds they contain can be considered biogenic in origin.

The debate over the answer has revolved round two distinct points: the origin of their complex organic molecules and the nature of the so-called 'organised elements'. Dr Nagy, who has been deeply involved in the investigation of both aspects, devotes over half of his book to this debate. He explains clearly the problems entailed in deciding about origin from physicochemical analysis alone. As he remarks in passing: "Were it not for the fossil remnants in coal, one would most likely still argue its origin." Above all, there is the problem of contamination. Since the compounds of interest are present only in trace amounts, minor contamination can vitiate the results obtained. "A few milligrams of dust which have fallen on and become mixed with 1 g of meteorite, would significantly alter the original hydrocarbon distribution and introduce contaminations which could be mistaken for indigenous compounds." It is hardly surprising that, although general opinion favours an abiogenic origin for the carbon compounds, definite proof is difficult to find.

The agreement that the 'organised elements' do not reflect indigenous life forms is more firmly based. But as Dr Nagy points out, the danger of judging from morphology alone is that judgement may be affected by context. He recounts: "the author once collected unicellular, blue-green algae, killed them in an organic liquid, made a microscopic preparation, and showed it to an experienced mineralogist whose speciality was meteorites. This scientist identified the dead algae as mineral grains from the Orgueil meteorite."

The second important reason for the attention paid to carbonaceous meteorites stems from the belief that they may contain some of the earliest solid material in the Solar System. The chemical, mineralogical and petrological studies that have been encouraged by this belief are described in detail by Dr Nagy, and take up about a third of the book. In this section, perhaps, the author's approach—"It is *not* the purpose of this book to evaluate the validity of reported findings and theories; the reader will have to do this to his own satisfaction"—works less well. The interpretation of the data is so uncertain that rather more guidance would have been valuable. In all, however, this book provides an eminently useful account of the present state of knowledge of carbonaceous meteorites, and can be recommended as a reference source.

A. J. Meadows