CORRESPONDENCE

Creation in California

SIR,—Your attitude to California's creationists is understandable. Unfortunately, it will help to perpetuate two popular fallacies which call for correction.

First, not all Bible-believers are like those referred to in the Californian textbook, who seem to think the Earth was created in six literal days, only a few thousand years ago. Such fundamentalists are right at one end of a long spectrum of belief. Others—probably a much larger number—accept the facts of geology, but think that the idea of many successive creative acts over the ages fits those facts better than the theory of natural evolution. Further along the spectrum still are a great number of theistic evolutionists, who think that some kind of evolution did occur but that natural selection alone cannot account for it: according to them, a liberal application of divine creative power must have been needed to make evolution work.

Secondly, there are more anti-Darwinists in British universities than you seem to realize. Among them is a friend of mine who holds a chair in a department of pure science "in a field bearing on the evolutionary question", to use your phrase. If his friends ask why he keeps quiet about his unorthodox views, he replies in words very like those used recently in another connexion by Professor Ian Roxburgh:

"Science is only concerned with the truth, and as the way to truth is by conjecture and refutation, why don't they (orthodox scientists) listen? Science is not like that at all. There is a powerful establishment and a belief system. There are power seekers and career men, and if someone challenges the establishment he should not expect a sympathetic hearing."¹

The majority of biologists accept the prevailing views uncritically—just as a great many competent Russian biologists were once brainwashed into accepting Lysenko's quackery. Others have thought for themselves and come to realize the flaws in contemporary Darwinism. But for them to speak out would be to invite ridicule, and probably ruin their careers. Can you blame them for keeping silent? Do you really suppose that the offer of a year's free subscription to *Nature* will tempt them to expose themselves?

Only a man at the peak of his career could afford to do this, as W. R. Thompson once did. Shortly before he retired he was invited to write an intro-

duction to a centenary edition of *The Origin of Species*. This eminent entomologist, whose recent obituary in *Nature* described his career as "long and distinguished" and his impact as likely to be "of lasting academic value"², declined because he was no Darwinist. Eventually he was persuaded, and wrote a highly critical introduction in which he said:

"It does occur to me, in the first place, that Darwin in the *Origin* was not able to produce palaeontological evidence sufficient to prove his views, but that the evidence he did produce was adverse to them; and I may note that the position is not notably different today.

"... This situation, where scientific men rally to the defence of a doctrine they are unable to define scientifically, much less demonstrate with scientific rigour, attempting to maintain its credit with the public by the suppression of criticism and the elimination of difficulties, is abnormal and undesirable in science. Thus are engendered those fragile towers of hypotheses based on hypotheses, where fact and fiction mingle in an inextricable confusion."³

These are not isolated remarks taken out of context. They truly represent Thompson's views. Anyone who thinks that only uninformed cranks reject Darwinism should read the whole of Thompson's *Introduction*. It will make him think again.

Yours faithfully,

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¹ *New Scientist*, September 28, 602 (1972).

² *Nature*, 238, 116 (1972).

³ *Everyman Library* No. 811 (Dent, London, 1956).

Objective Testing

SIR,—May I answer Roy Cox (*Nature*, 237, 189; 1972) on the advantages claimed for objective testing (OT) over the "essay" paper? I must stress that the so-called "essay" paper usually has some questions to which essay answers are necessary and also fragmented questions ("Write notes on: . . .", and so on) and often one or more problems.

After quarrelling with Dr Cox over several specific points, I should like then to deal with other points he did not mention.

(1) In the older type of OT, the

answer is a word or phrase. Since there are no suggested answers to prompt the candidate, we may call this type "recall" OT (ROT). In the modern multiple choice or matching, the answer is suggested—"suggestive" OT (SOT). When it is desirable to expect a candidate to know not an exact answer but merely a range in which the answer may be, SOT can be useful, for example, that the Battle of Hastings was in 1066 rather than 55 BC, 1492, 1815 or 1942. But this is the kind of SOT question for which it is most difficult to obtain other equally plausible suggested answers, or "distractors". In most cases, however, it seems to be used in preference to ROT either to allow mechanical marking or merely to be fashionable.

(2) The student can know what to expect just as easily in a well set essay paper as in an OT paper. How is a reappraisal of study objectives prompted more effectively by OT testing?

(3) The National Board of Medical Examiners compared OT and essay marks with something even more subjective than the latter—teacher opinion. Such a comparison is worthless.

In the work cited of Anderson, Dykes and Lennon, OT and essay marks were compared with the totals of both. Unfortunately, any unreliability in *X* or *Y* must be reflected in *X* + *Y*.

Two important advantages of OT are readier obtaining of spread and accuracy of marking.

(1) To be fair, a paper must cover the syllabus as widely and as evenly as possible. Although easier with a 50- or a 100-question OT paper than with a 6- or 8-question essay paper, spread can be obtained in a carefully set essay paper—and an OT examiner can allow his enthusiasm for certain areas of work to lead to bad spread.

(2) The more subjective the answers, the more difficult the marking. Essays are necessarily more subjective than answers to fragmented questions or problems, and, of course, OT questions. But difficulties with essay papers are often exaggerated and can largely be overcome. Because of the number of questions in an essay paper and of papers in an examination, errors in the marking of essay questions will tend to cancel one another and the residual cumulative error is buffered by the greater accuracy in marking fragmented and problem questions. Use of a marking scheme can sharpen accuracy of marking and increase agreement among those marking the same material. The more specific the wording of the ques-