

been underestimated because, even after floating at 32 km or higher for 10 h, sufficient water vapour contamination was present to increase the concentration by three orders of magnitude. Furthermore, the contamination remained at an intolerably high level after 14.5 h of float. This contamination has significance for stratospheric water vapour measurements and for all instruments and vehicles (aircraft and rockets as well as balloons) which, of necessity, contain water adsorbing surfaces. Such surfaces must be minimized as they may evolve water, particularly when irradiated by energy from the Sun. Contamination is also significant for measurements of other stratospheric parameters which may be affected by water vapour interferences, such as refractive index and ozone concentration.

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Deficiency of Gravity Corers for sampling Meiobenthos and Sediments

GRAVITY corers are widely used^{1,2} for the collection of the smallest marine metazoans (meiofauna) from subtidal grounds, and it has been generally accepted that cores which appear undisturbed give reasonably representative samples. But, after comparing gravity cores with samples collected by SCUBA divers, I suggest that this is not so.

Comparisons were made as a result of observations by divers on a muddy bottom at a depth of 30 m in Loch Ewe on the west coast of Scotland. It was difficult to collect all the flocculent material at the mud-water interface using core tubes of about 2 cm diameter however carefully the tube was inserted, even when the diver was steadied by a permanent frame support on the bottom. Similar difficulties were encountered with tubes of 4 cm diameter, and it was only when a considerably larger size (10 cm diameter) was used that the problem seemed to have been overcome. Divers were able to insert these large diameter tubes about 15 cm into the deposit and seal them with a rubber stopper fitted with a valve, without causing any observable disturbance of the sample surface. The tubes could then be withdrawn, sealed at the lower end, and returned to the ship apparently undisturbed. After carefully siphoning off the supernatant water to a few cm above the mud surface, it was possible to extract undisturbed cores in tubes of about 2 cm diameter—a convenient size for analysis of the fauna.

To assess the technique and to compare it with previous results from gravity corers, a series of samples collected in 10 cm tubes by divers, and subsampled as described in 2.2 cm tubes, was compared with another series collected using a light-weight gravity corer³ (17 kg in air) fitted with a 2.2 cm liner. Collec-

Table 1 Organisms retained in the Sieve

Month	Nematodes		Copepods		Others	
	Diver core	Gravity core	Diver core	Gravity core	Diver core	Gravity core
January	240	169	35	4	20	18
May	386	257	101	9	63	50
June	877	482	123	34	90	48
October	865	641	54	23	33	12

tions were made in several months of the year to check the consistency of results in varying conditions. The top 6 cm of mud from each core was used because it has been shown that most of the fauna was concentrated in this layer. Samples were preserved in 5% formalin, and screened through a mesh of 37 μ m. All the organisms retained in the sieve were counted, and comparisons of individual pairs of gravity and diver cores from different months are shown in Table 1. Nematodes and copepods, which made up about 90% of the fauna, are shown separately and all other organisms (mainly turbellarians, gastrotrichs and kinorhynchans) are grouped together.

The data, which represent the range of variation found throughout the year, show that the diver cores consistently gave substantially higher counts than the gravity samples. This applies to the copepods in particular, and it can be shown, by dividing cores into segments 1 cm thick, that these animals are largely restricted to the top 1 cm of mud. These results support the suggestion that the downwash caused by gravity corers in their descent disperses a substantial proportion of the superficial layer of deposit and that such instruments thus fail to collect all the animals associated with this layer. Most previous assessments of meiofauna (and especially copepods) by methods of this type may therefore be substantially underestimated. Furthermore, the deficiency of these instruments (or of any instrument dropped, however gently, onto the sea bed) in collecting intact the superficial layer of sediment should be recognized in selecting sampling techniques to study recently settled organic matter or pollutants which might be concentrated at the mud-water interface. A detailed report on this work is in preparation.

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BIOLOGICAL SCIENCES

Effects of Marihuana on the Solution of Anagrams, Memory and Appetite

ALTHOUGH anecdotal opinions on the effects of marihuana (*Cannabis sativa* L.) are common, little objective information is available. The following study is concerned with the effects of marihuana on memory, simple intellectual performance, and hunger in humans.

Thirteen adults aged between 22 and 37 served as volunteer subjects. In the marihuana condition there were three men and four women, all of whom had previously had several experiences with marihuana. Six of them, two men and four women, served as controls. All subjects knew beforehand whether they would be given marihuana. The experiment was run in two parts. The conditions for part A were the same for both marihuana and control subjects. Part B differed only