A MULTI-PURPOSE MODULAR LIMNOLOGICAL SAMPLER

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Abstract

This paper describes a new type of multi-purpose limnological sampler, based on several modules which, when fitted together in various ways, and with accessory items, can be used to sample in many different fashions. The main advantages of the sampler are that, in addition to its ability to perform a variety of functions, it is both cheap and light. It is particularly suitable for multi-purpose work on remote waters to which transport of heavy or bulky equipment is difficult or expensive. The complete package described, best operated by two people, currently costs £75 and weighs 20 kg. It enables the operators to sample several aspects of water, sediments, phytoplankton, macrophytes, zooplankton, zoobenthos and fish in several ways, both qualitatively and quantitatively, from a boat or from the shore.

Introduction

A wide range of sampling equipment is now available to limnologists and oceanographers, ranging from the simple Secchi Disc to extremely complex electronic devices. Their designs and uses have been advertised or reviewed several times in recent years, notably by Holme (1964), Saur (1964), Schwoerbel (1966), Ricker (1968), Vollenweider (1969), Edmondson & Winberg (1971) and others. Many modern instruments are highly specialised and may be expensive or difficult to transport. The tendency in their design has been towards specialisation and sophistication rather than multiplicity of use and simplicity.

During recent limnological work in isolated parts of Scotland (Shetland) and Africa (Malawi), where ease of transport and potential multiple use of items of equipment were of paramount importance, considerable effort was directed towards rationalising equipment required for basic field survey in limnology. The result was the development of a multi-purpose sampler made up mainly of simple modular units (many of them plastic) and a number of accessory items to widen its use. This paper describes the design and construction of such a sampler and its potential for general survey work. It is intended that a specific field survey of a single ecosystem, based on its use, will be described elsewhere.

Design

The basis of the design of this equipment is that one or more individual units of various types build together in particular ways to make up samplers for different purposes. This account first describes these units in detail and then how they may be incorporated into different instruments. It will be obvious that there are many variations on the theme presented here and only the major units developed by the authors are discussed. Many of the actual instruments are based on well-known types of sampler and these are acknowledged where appropriate. The component units are illustrated in figs. 1-3 and Plate 1.

The units

1. Tubes

1 A. Top Tube Unit (Fig. 1). This is made from a piece of 42 mm dia PVC tubing 37 cm long. The male and female components of a 42 mm dia union coupling are welded...