Memorandum 3.

The form of aquarium which, after upwards of five years' experience and observation on the natural habits of the various animated tenants, I have now adopted, consists in a four-sided vessel having the back gradually sloping upwards from the bottom at an angle of 45 to 50 degrees, and the consequently extended top sloping slightly downwards and resting on the upper part of the back. The bottom, therefore, becomes necessarily narrow. The front for the purposes of observation, and the top for the admission of light, are to be of glass; the back, ends, and bottom being constructed of slate; the whole fixed in a stout framework.

The advantages of this arrangement are:—

First. That it allows of a most extended view of the whole interior of the aquarium.

Secondly. That it enables the occupants to resort to water of any depth they may desire, or even to ascend the sloping back and emerge from the water.

Thirdly. It admits of a much larger surface of water being exposed to the action of the light; and

Fourthly. The sloping top allows the water which condenses on the glass, from the effect of radiation, to trickle off and return to the aquarium without first resting on the zinc or iron framework.

I need hardly mention that the sloping back is to be covered with light rock-work extending to a short distance above the water line.

XXXV.—*On a Mode of giving permanent Flexibility to brittle specimens in Botany and Zoology.* By Prof. J. W. Bailey, U.S.*

The excessive fragility, in the dry state, of many plants, and particularly of those which secrete carbonate of lime, is well known to botanists. There is no herbarium in existence in which the specimens of *Amphiroa*, *Jania*, *Corallina*, *Halimeda*, *Liagora*, *Chara*, &c. are not in a more or less mutilated condition, which becomes worse every time the plants are examined. In studying a large collection of the stony Algæ I was led to remark their perfect flexibility while moist, which passed to great brittleness when dry, and it occurred to me that if they could be kept permanently moist they would remain permanently flexible. I then remembered that General Totten, of the U.S. Engineers, had mentioned to me, some years ago, his success in preventing the cracking and peeling-off of the epidermis of various shells, by impregnating them with chloride of calcium. I also remem-

* From Silliman's Journal for July 1854.

bered Boucherie's experiments with the same substance in giving flexibility to wood. The principle that *a substance which is flexible when moist, will remain permanently moist, and therefore permanently flexible, when impregnated with a deliquescent salt,* is so obviously true, that it needed no experiments to convince me of its applicability to the fragile plants above mentioned, and to many other specimens in natural history; but as practical difficulties often occur in the application of correct principles, I have tested the process by numerous experiments in which chloride of calcium was employed to give flexibility to various vegetable and animal products, and the results have fully equalled my expectations. My specimens of *Amphiroa, Jania, Corallina,* &c., after being impregnated with this salt, and then exposed for months to the air, can be handled as freely as if just taken from the water, and they permanently retain nearly the utmost degree of pliability they are capable of receiving. Species of dry, crisp and brittle Lichens when treated in the same way became soft, elastic and flexible, so as to bear very rough handling with perfect impunity. Many of the common Algæ which shrink much in drying, and therefore assume a very unnatural appearance, and besides are apt either to become cracked or torn, or to wrinkle up the paper to which they adhere, retain after immersion in this salt nearly their normal degree of distension, and preserve a much more natural appearance than when dried in the usual way. Many dried specimens of plants, whose leaves, flowers or fruit dropped off almost at a touch from specimens in my herbarium, became permanently pliable when immersed for a short time in a solution of chloride of calcium, and could then at any time be handled freely, while their appearance was in no degree injured.

In the animal kingdom, the results obtained in restoring permanent flexibility to dry and brittle specimens of Crustaceans, Insects, Gorgonias, Sponges, &c. were equally satisfactory, and have convinced me that almost every naturalist will, in his own department, find many useful applications for this process.

The *mode of application* which I have employed is to immerse the dry specimen for some time in a neutral saturated solution of chloride of calcium (which any one can make for himself by saturating hydrochloric acid with marble), and then after the specimen has become sufficiently softened to bend easily, remove it and let it drain in the open air. In some cases where the specimens do not imbibe the salt readily, it is well to soften them in warm water before immersion in the salt. A speedy impregnation will then take place, after which the specimens, if plants, may be subjected to moderate pressure in the usual way, and restored to the herbarium; while other specimens may be kept on shelves, or in any way usually employed for similar objects,

and all will for any length of time retain sufficient moisture to prevent brittleness. The salt being neutral, no fear need be apprehended of its injuring colour or texture, while its antiseptic properties will aid in the preservation of matters liable to decay.

BIBLIOGRAPHICAL NOTICES.

A Manual of Natural History for the use of Travellers. By Arthur Adams, W. B. Baikie, and Charles Barron. London, 1854. Van Voorst. 12mo.

"The design of the following pages," say the authors in their preface, "is to endeavour to supply what seems to be a blank in the scientific literature of this country, for, although numerous treatises exist upon every branch, yet no work has hitherto appeared, comprising either succinctly or in detail, a comprehensive outline of natural history. It may appear presumptuous," they add, "on the part of the authors to attempt to grapple with such an extensive range of subjects"—and we regret to say that a careful examination of the book only shows us how well founded was this fear. There can be no doubt, in fact, that the authors have entirely miscalculated their strength, or they never would have attempted so arduous an undertaking. This is the more to be regretted, as we fear that a work with the above attractive title, brought out under the auspices of a publisher so well known for the first-rate character of his publications, will inevitably to a great extent preoccupy a place in our scientific literature which might be much more creditably filled.

The authors have fallen into an error in their very first step,—the general design and scope of the work. Let us first see what are the objects of travelling, or indeed of any, naturalists, and the conditions to be fulfilled by a 'Manual' intended for their use, and we may afterwards consider how far their wants are supplied in the work before us. The study of Natural History may safely be divided into two branches—the collection and arrangement of species, and the study of the structure, habits, and general classification of the numerous creatures inhabiting our planet. The same person may undoubtedly combine the study of both branches, but they may nevertheless be regarded to a great extent as distinct, and capable of being carried on independently of each other; accordingly we find that works on natural history are generally directed exclusively to one or other of them. Now the collector of species, whether for sale, or for his own personal gratification, desires, if possible, to ascertain the actual specific names of the objects which come in his way, their comparative rarity and so forth, so that nothing short of a "Species," or at all events a "Genera," with copious information as to the geographical distribution of the species, can serve his purpose. The reader need but reflect on the voluminous works devoted to description of portions only of the organic kingdoms of nature, to be convinced that an attempt to bring together all the species, or even