for this work have been found in the Services, where it is possible to examine a controlled personnel and to obtain at a later date reliable records of their after-histories. Few of the results have yet been published, but all are available for publication eventually when enough evidence has been accumulated.

3. The main part of the work on deep diving done by the M.R.C. was on the fundamental question of the saturation of the tissues with gaseous nitrogen. The report on this work forwarded to the Admiralty consisted of three sections, each of which has since appeared in the *Quarterly Journal of Experimental Physiology*. The work done on the psychological side occupied only a very small fraction of the time; and as nothing of importance emerged from it, no report has yet been published, though the knowledge gained is available to anyone inquiring about deep diving from a civilian point of view.

4. The investigation of rifle shooting was not undertaken at the request of the military authorities, but at the instance of an academic psychologist who happened to see in the operation an interesting combination of manual, visual and psychological factors. The results have not been published, but they are being prepared for publication. The War Office was sent a report as a matter of courtesy.

5. In the matter of the selection and training of anti-aircraft listeners, the actual investigations made by the M.R.C. have taken the form of fundamental research into questions of aural localisation; and the results have been, or are being, published.

We need scarcely say that no further space can be afforded in these columns for a discussion of the questions raised by the Union of Democratic Control as to the use made by the fighting services of civil research organisations.

EDITOR OF "NATURE".

Proportion of Heavy Water in Natural Water

IT has been suggested that the proportion of heavy water in natural waters may vary according to their source. It is, however, unlikely that any considerable variations occur.

Consider, for example, the Dead Sea. We may suppose that the rate of influx of water into the Dead Sea is equal to the rate of loss by evaporation. In a case like this a steady state will eventually be reached—and in the case of the Dead Sea, presumably has been reached—such that the proportion of heavy water in it remains constant with time. At the steady state, the composition of the inflowing water is the same as that of the water vapour evaporating away. So the Dead Sea is in equilibrium with water vapour of the same composition as the inflowing water; and, in consequence, it contains but a very slightly greater concentration of heavy water than the inflowing water. In fact, the excess is no more than would be gained by a single distillation at a pressure equal to the vapour pressure of the Dead Sea—a negligibly small amount.

This argument assumes that the inflowing water is at once distributed evenly throughout the whole of the Dead Sea. Imperfect mixing will permit of a greater concentration of heavy water; but it is unlikely even then that there is any remarkable concentration of heavy water in water from any natural source. We may take it, then, that natural waters contain a sensibly constant concentration of heavy water; or, to speak more cautiously, that the processes of evaporation and condensation in Nature are unlikely to produce any considerable separation of the two kinds of water.

H. A. C. MCKAY.

33, New Road,
Croxley Green,
Herts.
March 27.

IN connexion with the foregoing letter, some results may be quoted of an examination of Dead Sea water carried out in this laboratory by Dr. A. E. Martin.

The Dead Sea water was obtained by the kindness of Palestine Potash, Ltd., and consisted of samples taken from near the surface and at a depth of 53 metres below the surface.

These samples were distilled and, in addition, the salts remaining after ordinary distillation were reduced to dryness by the application of heat, but none of the distillates was found to be heavier than ordinary pure distilled water prepared in the laboratory.

To determine the density, a spherical mass of silica attached to the beam of the balance by a fine silica fibre was weighed in the various samples of water and the greatest difference in density between distilled water and distilled Dead Sea water was 0·00003, the uncertainty of measurement being about 0·00002.

It does not appear, therefore, that there is any notable proportion of heavy water in the Dead Sea.

R. ROBERTSON.

Government Laboratory,
Clement's Inn Passage,
Strand, London, W.C.2.
March 29.

Spectrum of the HD- and D_2-Molecules

WE have photographed the molecular spectrum of hydrogen under high dispersion and obtained a series of photographs of samples with increasing amounts of the heavy isotope ranging from pure H_2 to practically pure D_2. We are indebted to Prof. H. S. Taylor, of Princeton, for the heavy hydrogen. In this way it was possible to decide unambiguously whether a line is due to H_2, HD or D_2. It is well known that a considerable part of the H_2-spectrum was analysed chiefly through the efforts of O. W. Richardson and his co-workers, but there remains a great number of problems concerned with the analysis and interpretation of this complicated spectrum. The main purpose of the present investigation is to obtain additional material which can be used for a further analysis of the molecular spectrum of hydrogen and to help to clear up doubtful points in its interpretation. We are confident that in this way our knowledge of the structure of the hydrogen molecule can be greatly increased.

The comparison of the three spectra gives indeed a vast amount of interesting information for which we must, however, refer to the full account of the work which is to appear elsewhere. We wish to give here only some of the results of the analysis of the bands of HD and D_2 which are analogous to the Fulcher bands of H_2. These bands have a relatively simple structure and do not show markedly the decoupling effects which are so characteristic of most