this movement are in fact caused by the movement. This is a matter of scientific opinion on which I express no view.

I would point out that in this air crash, as in all others occurring within my jurisdiction, every death was investigated by a complete and detailed post-mortem examination, as it is only by such an examination that the real cause of death can be established and the error of attributing death to some obvious external injury avoided. Am I right in assuming that *all* the cases on which Dr. DuBois bases his opinion were similarly examined?

I am sending a copy of this letter to Dr. DuBois, as I am sure that he and his colleagues in the U.S.A. are keenly interested, as are investigators in this country, in assessing all possible evidence in the hope of lessening the number of air crashes and of lowering the mortality in those that do occur.—I am, etc.,

HAROLD G. BROADBRIDGE,
H.M. Coroner, County of Middlesex, Western District.

Breathing during Deep-diving

SIR,—I feel that there should be a more complete ending to the unfinished business mentioned in the late Dr. Millais Culpin's article (November 1, p. 955). I am not writing to win a point in a debate which can only be one-sided, but feel that a few facts should be placed on record.

There is no mention in this article of the fact that the psychological explanation of the breakdown of men breathing air at great depths has now been abandoned by all authorities. Shortly after the investigation described, Behnke discovered that the highly abnormal sensations and behaviour encountered under these conditions could be completely relieved by the breathing of mixtures in which the nitrogen was replaced by lighter, physiologically inert gases such as helium. Similarly these symptoms could be reproduced at much lower pressures if a heavier inert gas such as argon was substituted for nitrogen. All diving to great depths is now carried out using helium and oxygen mixtures. The divers behave perfectly normally, yet the physical dangers and risk of bends are as great with helium mixtures as with air. Further, it has now been shown that men undergoing excessively rapid compression to great depths are unable to ventilate their lungs properly, as up to 45 litres (measured at 1 atmosphere) of air will enter the lungs in a minute or less during very rapid descent. The inevitable temporary retention of carbon dioxide with added nitrogen intoxication causes a transient but intense sensation of being anaesthetized. One of the divers mentioned in the article described this sensation with great accuracy: "I felt dizzy at 40 fathoms and at 45 felt in a nightmare. Felt like going under ether—that made me think of going unconscious." In my own experience many men who were divers, and took an active and successful part in underwater warfare, suffered from fear of the darkness and the depths. Their courage and self-control under these hazardous conditions roused the greatest admiration. No group of men can be neatly divided into those near breakdown and those composed of cast iron. Human beings are not like that. In the cases mentioned by Culpin it is certain that the reaction to carbon-dioxide retention and nitrogen intoxication would be most marked in those who were fighting claustrophobia and loss of confidence.

Culpin also stated that the breathing of oxygen instead of air at high pressures "made no difference to the problem." I do not think that he ever saw men convulse with oxygen poisoning, but I feel sure that he would have been convinced if he had seen animals resting quietly in 6 atmospheres of air, and then twitching and convulsing to death when this was substituted by oxygen. This has none of the subtleties of shellshock or disordered action of the heart; oxygen under these conditions kills, and kills more certainly and quickly than arsenic.

Finally, may I close this letter by paying tribute to a "grand old man" of medicine who was so often right, but, I think, in this case was wrong.—I am, etc.,

Birmingham, 15. K. W. DONALD.

Dupuytren's Contracture Treated with Vitamin E

SIR,—Dr. R. J. de Carteret in his letter (October 25, p. 939) regarding my article (June 21, p. 1328) on Dupuytren's contracture refers to my conclusions as "this hurried opinion." In my article I stressed that all patients had been given vitamin E for a minimum period of three months, in fact some had had vitamin E for one year. It was also used as the sole form of treatment and every effort was made in estimating the deformity to exclude any human error.

Dr. de Carteret refers to his first patient but to no others. In my article I also stressed that pain, tenderness, and swelling in the palmar fascia could disappear without any form of treatment. Thompson (*British Medical Journal*, 1949, **2**, 1382), who reported good results from treatment of Dupuytren's contracture with vitamin E, regarded these symptoms and signs as a favourable response of the condition to treatment with vitamin E, while de Carteret regards the disappearance of these as a favourable sign. We are not told why penicillin was injected locally or at what stage of the treatment it was given.

I feel that Dr. de Carteret has unjustly accused me of a "hurried opinion," and I also wonder whether the condition he is treating is Dupuytren's contracture and whether he himself had doubts about this and used penicillin.—I am, etc.,

Oswestry. H. J. RICHARDS.

POINTS FROM LETTERS

The Pre-registration Year

Dr. R. D. BROOKE WILLIAMS (Rochester, N.Y.) writes: The compulsory pre-registration internship for young doctors which has been accepted, and which starts operating in 1953, is a change in the medical sphere which is worthy of a few moments' consideration. Are the arrangements such that any benefit will be forthcoming to the doctor who would have interned anyhow, apart from the benefit, if any, of an additional obligation? . . . A successful internship does not depend on the young doctor alone; it depends also on the hospital in which he serves his internship. . . . If the real aim of the compulsory internship is to be achieved the hospital's obligation to the intern can be met to a great extent by observing a number of fair, practical, and reasonable points: (1) the filling of all vacancies for interns in any hospital on a fair competitive merit basis, regardless of whether the applicant hails from London or the provinces; (2) at least five hours per week of instruction by suitably qualified members of the staff, which would include *x*-ray and pathology conferences; (3) credit towards subsequent promotion for good and practical work in the care of patients in the ward; (4) a monthly meeting with a senior member of the medical staff, and representatives of both the administration and nurses; this meeting would improve the team spirit and facilitate discussion of problems arising from everyday work on the ward such as procedures and techniques; it would also give the intern a chance to voice his opinions on improving the efficiency of the institution; (5) a definite association of each intern with a chosen registrar who would act as his friend, guide, and adviser; it would be this registrar's task to brief the new intern and to have sufficient working knowledge of the hospital routine to see that the intern was not overburdened with unnecessary matters. We should try to stave off the danger the intern faces of losing his individuality . . . by giving him a fair training programme and see that he does not become like a bead on an abacus, or our calculation may turn out wrong in practice.

Diet and Stamina

Dr. N. R. DHAR (Allahabad, India) writes: With reference to Dr. A. A. Lewis's letter on "Diet and Stamina" (August 23, p. 445), I have to point out that his statement that "the daily requirement of so-called 'first-class' protein for a human being has been estimated at 60–70 g." is not quite correct. Man is always trying to have more animal proteins in his diet. He is not fond of vegetable proteins. But even the animal protein consumption in highly advanced countries like the United Kingdom, Ireland, France, Holland, Belgium, etc., is less than 60 or 70 g. per day as stated by Dr. Lewis. To-day we may safely fix the total protein requirement of a human being as 1 g. per kg. of the body weight of the person, and half of it must be of animal source. Animal proteins supply the adequate essential amino-acids required for the maintenance of health more easily than vegetable proteins. Hence the consumption of animal proteins for poorer nations must go up.