tive period. We have classified them as a separate species called *Triticum Borisovi* Zheb. The basic peculiarities of this type are the dark green colour of the shoots, the pubescence of the shoots and leaves and the glumes of the spikelets. The stem of the spike is only slightly brittle. The grains are tightly wrapped into flower paleæ. The number of chromosomes is seventy.

We have also obtained 70-chromosome amphidiploids from crossing *T. durum* × *T. vulgare*. Their fertility is not high but they differ in their morphological characteristics. In some combinations the kernel is good. A more complete account of these amphidiploids will follow later upon completion of more extensive research.

Both the 70-chromosome amphidiploid types have a common peculiarity: their lower fertility as compared with the 42- and 56-chromosome types.

In conclusion, I wish again to stress that colchicine is exceedingly effective as a factor in increasing the number of chromosomes. This is shown by the facts outlined in our work, from which it may be seen that, in a brief period, we succeeded in obtaining more than ninety amphidiploid types of wheat belonging to the three chromosome groups 42, 56 and 70, which may be considered as new botanical species. To the best of our knowledge these amphidiploid types of wheat have been obtained for the first time, and amphidiploids in general, in such large quantities, also for the first time.

OBITUARIES

Dr. J. K. Roberts, F.R.S.

IT is difficult for the colleagues and friends in the Laboratory of Colloid Science, and others who have been intimately connected with John Keith Roberts, to realize that he has departed from us. He died on April 25, aged forty-seven.

I first met 'J. K.' when he was working in the Cavendish Laboratory. At that time, under the genial guidance of Lord Rutherford, the main interest in the Cavendish lay in the problems of nuclear structure. To 'J. K.', however, the nucleus had no attraction; he was both by training and inclination steeped in the classical tradition of physics based upon thermodynamics. He was at the time engaged upon the problem of the extent to which thermal energy is exchanged when gas molecules hit and leave a solid surface. He found that the values for the accommodation coefficient were coming out unexpectedly higher than anticipated from Baule's calculations. In my Department we were searching for different methods by which layers of gas adsorbed at metal surfaces could be detected and examined, and it seemed possible that the high values for the accommodation coefficient which Roberts found were due to the presence of a chemisorbed layer of gas on the tungsten wire which he was using. If this proved to be the case, the accommodation coefficient might serve as a useful tool for exploring surfaces.

Roberts welcomed with enthusiasm the suggestion of moving from the Cavendish to next door, and taking up this field of inquiry. He devoted the next ten years of his life to this problem. In this investigation he was strikingly successful. Roberts not only showed how one could trace and follow the building up of adsorbed monolayers on tungsten wires by means of the accommodation coefficient of neon as an indicator, but also later developed methods for actually measuring the heat of adsorption of gases on thin wires by making the wire one arm of a Wheatstone bridge. A series of papers both experimental and theoretical testify to the great skill, painstaking accuracy, and attention to detail which characterized all his work. Methods had to be worked out for circulating pure neon over scrupulously clean wires and for the admission of gases at minute but regulated pressures. The apparatus was essentially simple, but the elimination of contamination in the system indicates the extraordinary cleanliness which he achieved. Many important discoveries were made, and what had hitherto been matters of opinion experimentally tested. Thus it was found that when the tungsten wire was clean, chemisorption of several elementary gases occurred without appreciable energies of activation, that a slow process of activated diffusion could take place into the wire, and that gases could be quantitatively displaced from the surface. When diatomic gases were chemisorbed as atoms, holes were left in the surface which play an important part when chemical reactions take place in the adsorbed phase. He showed that there could be a transition from immobile to mobile monolayers, and revealed how the influence of mutual interaction between the adsorbed particles could be traced both in the form of the adsorption isotherm and in the thermal behaviour on adsorption.

Apart from this field of inquiry, which he made particularly his own, Roberts took a great interest in many other problems, especially in the mechanism of melting of a crystalline solid and in the origin of the elasticity in rubber. He was always ready to give his advice and criticism to those commencing research. Here, for Roberts, no trouble was too great, no time too long. Many have gained from the lasting impression he made by his directness and simplicity of approach in experimental attack, his insistence upon rigour in argument and soundness in thermodynamic treatment. His lectures were clear and attractive, and his book on thermodynamics has already gone into the third edition. Little can be said at present about his activities in the War, but he took a post in a naval research establishment that was difficult administratively, and involved research and development along important and novel lines. Here he was an unqualified success.

In the laboratory Roberts was always cheerful and ready to deal with all the vexatious details which arise—this in spite of his health, which was never good. At times a leg gave him much trouble, but no one ever heard a word of complaint. He took much pleasure in the fact that his work was appreciated, both at home and abroad. He had been elected to the fellowship of the Royal Society and quite recently made a fellow of Christ's College, and was looking forward to his return to Cambridge, where his heart lay. ERIC K. RIDEAL.

WE regret to announce the following deaths:

Dr. J. A. Campbell, of the research staff of the National Institute of Medical Research, on April 20, aged sixty.

Lieut.-Colonel Stanley Casson, reader in classical archæology in the University of Oxford, aged fifty-four.

Mr. H. B. Walters, O.B.E., keeper of Greek and Roman antiquities in the British Museum during 1925–32, on April 24, aged seventy-seven.