

tions obtain which make a practical test more helpful. Nevertheless, the temperature is of great importance and many means are employed of lowering it, such as adding salts which absorb heat on volatilisation.

The rapidity of detonation, the length of the flame, and the heat evolved, all influence the readiness with which explosives ignite gas or coal-dust; but in this connection knowledge and progress have been chiefly promoted by direct experiment at the various testing stations here and abroad.

The filling material for shells has been the subject of much experiment and trial by the different countries. Picric acid, under the various names of melinite, lyddite, shimose powder, etc., has been extensively tried and found wanting. Ammonal, containing ammonium nitrate, with a large percentage of trinitrotoluol and finely divided aluminium, is a very safe and powerful explosive, and has been adopted as the charge for shells by the Austrian Government. It has the disadvantage of containing the hygroscopic ammonium nitrate as an ingredient, and must consequently be specially protected against moisture. At present, trinitrotoluol is the body which has commended itself to most of the Governments as the best bursting charge for shells, torpedoes, and general military blasting work, and has just been adopted by our own Government.

Experience in America, South Africa, and Australia has shown that the fruit-grower has a real friend in explosives, and it seems to me that, in this country also, we must wake up to this beneficent aspect of explosives and the means they offer of attaining results otherwise impossible.

In the case of tree planting, it is not the mere comparison of the cost of the excavation of the hole in which to place the tree which has to be considered. When an explosive is employed, the soil is shaken up and fissured for a comparatively wide area beyond the hole actually required for the tree. When, as often happens, there is a hard and impervious subsoil beyond reach of the spade, this is also opened and fissured, and experience has shown that trees planted in ground prepared by explosives make a much more vigorous and rapid growth than when planted in the ordinary way. Some trees have begun bearing after four years, while others similarly situated but spade planted did not yield fruit until six years.

In the case of existing orchards little can be done in the ordinary way to aerate or render the soil more pervious to the roots and moisture, but a small cartridge inserted at some depth below the tree, or a larger one exploded at a depth of 3 ft. or so below the surface and midway between trees planted about 15 ft. apart, has a most beneficial effect in loosening the soil without injuring the trees. The roots have less resistance to overcome, the soil is aerated, the moisture retaining properties improved, and a new lease of life is thus given to an old orchard; the trees become more vigorous and productive, and indeed are rejuvenated.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

LEEDS.—The following appointments have been made:—Mr. Howard Priestman to be lecturer in textile industries; Dr. A. M. Pryce to be demonstrator in bacteriology; Dr. H. E. Woodman to be research assistant in animal nutrition; Mr. H. A. Wyllie to be additional assistant lecturer and demonstrator in agriculture.

The second annual Yorkshire Summer School of

NO. 2333, VOL. 93]

Geography will be held at Whitby on August 3–22. The work of organisation has again been undertaken by the University of Leeds, and the director of the school will be Prof. Kendall. The special subject this year will be the British Isles, treated in a general course, dealing with land forms and structure, meteorology and economic geography. There will be alternative courses at the choice of each student on (1) agriculture, rocks and soils, and (2) oceanography, rivers and river development, and the evolution of transport. As in last year's course, special attention will be paid to practical and field work.

LONDON.—The council of Bedford College has made the following appointments:—Assistant-lecturer in mathematics, Mr. C. Clemmow; demonstrators in physiology, Miss G. Hartwell and Miss N. Tweedy; demonstrators in chemistry, Miss E. Field and Miss B. M. Paterson; demonstrator in geology, Miss I. Lowe.

DR. F. R. MILLER, of the department of physiology, McGill University, Montreal, has been appointed professor of physiology in the Western University, London, Canada.

THE distribution of prizes at the Horticultural College, Swanley, Kent, will be held on July 23. The prizes will be presented by Lady Reid, and Sir George Reid, G.C.M.G., High Commissioner for Australia, will give an address. The chair will be taken at 4 p.m. by Sir John Cockburn, K.C.M.G.

THE governors of the Imperial College of Science and Technology have appointed Dr. A. N. Whitehead, F.R.S., to the newly constituted chair of applied mathematics, and Dr. C. G. Cullis to the professorship of economic mineralogy. These changes form part of the general scheme of development of the Imperial College "for the provision of the fullest equipment for the most advanced training and research in various branches of science, especially in its application to industry."

THREE issues of the *Undergraduate*, the University of London magazine, published by the Students' Representative Council, have been received. The first issue announced in December last that four numbers of the magazine would be published during the current session, and gave the last day for receiving contributions for the next issue as "19th January, 1914." Yet the second number bears the date May, 1914, and it says nothing of the number of issues during the session. The third issue is dated July, 1914. Sir Henry Miers writes in the December issue:—"A magazine which will represent the University as a whole, and will give to all its members a medium of free expression upon the numerous and increasing matters of University interest will . . . satisfy a very real need." We trust that the magazine will meet with the success to which the variety and interest of its contents entitle it.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 25.—Sir William Crookes, president, in the chair.—Sir W. Crookes: The spectrum of elementary silicon. The author has tried in vain for years to get pieces of fused silicon in an approximate degree of purity. Lately the Carborundum Co. at Niagara Falls sent him three samples giving an analysis of 99'56, 99'86, and 99'98 per cent.