as will also houses built for workers at mines or oil wells which will be useless when the mines or wells are exhausted. The new allowances will apply to expenditure incurred since April 1, 1944.

University of Birmingham

AMONG other matters dealt with by Dr. Raymond Priestley, vice-chancellor of the University of Birmingham, in his annual report to the Court of Governors, is the part to be played by the universities in making possible the great increase of exports of Britain which will be a vital necessity for us in the post-war world, when a premium will be put on industrial efficiency in every field. One contribution is through the production of an increased flow of engineering graduates of the finest possible quality, from among whom will be found not only the professional engineers of the next generation but also men to fill high executive positions in industry. With this object the University of Birmingham is seeking to rebuild and re-equip its Departments of Mechanical and Electrical Engineering. The private appeal to local firms last year for £250,000 has already met with a gratifying response. No specialization can be admitted in the undergraduate stage, though fundamental work in the University engineering laboratories must be supplemented by vacation courses in industry itself. Nevertheless, something more than this preparation is needed by those among our best engineers whose aptitude and potential capacity attract them to administrative and managerial functions.

A gift from Messrs. Joseph Lucas, Ltd., of £112,000, under a seven-year covenant, for the establishment and maintenance of a chair and University lectureship in production engineering, gives a prospect of meeting the need. The University of Birmingham, which serves an area containing the largest concentration of the engineering and metal-working industries in the United Kingdom, is in every way suited to be the home of this development, and the University has agreed to institute a postgraduate course in production engineering, at present to be contained in the Department of Mechanical Engineering. The objects of the new development are to foster through research the full development of every aspect of the science of production engineering and the education through special postgraduate courses of a supply of men who possess not only a sound grasp of the fundamentals of engineering but also a specialized knowledge of production methods and processes and the varied aspects of organization and control. Such a course considerably lengthens the period of engineering education in these special cases, and problems of maintenance of students will be involved. To finance this aspect of the scheme through the first few years, Sir Peter Bennett has generously given £10,000.

Development of the Oil Industry

AT a meeting of the Manchester University Branch of the Association of Scientific Workers on February 1, Dr. H. Steiner gave a lecture on the development of the oil industry. Oil was first produced industrially in 1859, when 300,000 gallons were obtained; by 1938 the production of crude oil had risen to 70,000 million gallons. In the last century the most important product was kerosene; since 1900 the advent of the motor-car has shifted the importance to the lighter fractions of the crude—mainly petrol. Due to the increased demand for the light fraction, production became unbalanced, in that too much high- and too little low-boiling fractions were produced. This was remedied by the cracking process, which by applying heat and pressure, produces lower boiling hydrocarbons from the higher boiling ones.

Later, the demand arose for high-quality petrol for improved automobile- and particularly aero-engines. Branched-chain paraffins were produced which are more resistant to 'knocking' than straight chains and can be used in engines working at high compression and thus high efficiency. The first branched-chain paraffin produced commercially was 'iso-octane' (2–2–4 trimethylpentane). This is made from *iso*-butylene, a constituent of the cracking gases. To-day very large amounts of branched-chain paraffins are produced from these gases by combining *iso*-paraffins such as *iso*butane and olefines (for example, butene) in the 'alkylation reaction'.

A later development to produce high-quality petrol is cracking in the presence of catalysts, which assist in forming branched-chain hydrocarbons. The main technical difficulty is that, in the course of the reaction, carbon is deposited on the catalyst and destroys its activity. By burning off the carbon under carefully controlled conditions, avoiding overheating, the activity can be restored. The most recent method employs so-called 'fluid catalysts', that is, very fine powders, which are dispersed in the hydrocarbon vapours and then passed through the reactors. On emerging from the reactors the catalyst is separated, dispersed in air and then passed through a second heated zone where the carbon deposits are burned off. It is then ready to be used again. A very important development is the production of chemicals from petroleum, mainly from the cracking gases. Finally, probably the most important synthesis is that of butadiene. Of about 600,000 tons required for the United States synthetic rubber programme, about 400,000 tons are made from petroleum, mainly by the dehydrogenation of butene over catalysts at high temperatures.

Animal Concealment and Flash Coloration

MOMENTARY display by animals of conspicuous colours followed by reliance upon procrypsis has long been known. Jenner Weir (*Trans. Ent. Soc. Lond.*, 22; 1869) directed attention to the conspicuous hind wings exhibited in flight by many otherwise cryptic moths and *Oedipoda* grasshoppers, and Lord Walsingham, in 1890 (*Proc. Ent. Soc. Lond.*, **52**; 1890), suggested that the sudden change when such flying insects came to rest serves to confuse the visual impressions of a pursuing enemy. H. B. Cott, in his work "Adaptive Coloration in Animals" (1940), devoted several pages and many figures to this 'flash coloration'. An interesting new example of the principle has been described in a letter from Staff-Sergeant J. E. Marson (6th (East Africa) Inf. Bde. Workshops, E.A.E.M.E., South-East Asia Command). "In Ceylon I have noted the effectiveness of the same principle as applied to certain species of spiders. The female of *Herennia ornatissima* (Doleschall) is a medium-sized spider, grey and brown above, with the underside of the abdomen and cephalothorax having brilliant yellow, orange or red markings, according to the maturity of the spider. It spins its web on rubber trees, from stumps of branches to the main trunk. The web is nine inches to a foot in length, and is very close to the trunk at all parts. The centre of the web is tubular and is fastened to the trunk by the tip of the tube. In this tubular depression, the female rests, almost perfectly camou-