value. The declining social status of the motorcycle—reflected in a fall in numbers from nearly 2 million to 1.3 million during the 1960s—is expected to reach rock bottom around 1957, after which the numbers might increase to something like their present value as the population grows.

Goods vehicles account for much of what remains of the new traffic. The actual numbers are sensitive to the state of the economy, because the volume of freight is highly correlated ($P=0.99$) with the Gross Domestic Product, but Mr Tulpule predicts an increase from 0.6 to about 1.2 million heavy vehicles, and 0.8 to 2 million light vans, on the basis of an assumed 3 per cent per annum rise in the GDP. The estimate allows for a trend towards higher-capacity lorries that is suggested by statistics for the last ten years.

One way of helping all the traffic to keep on the move would be to follow the other European countries that enforce a minimum power-to-weight ratio on road vehicles. According to a Road Research Laboratory report by Mr P. F. Everall, who has followed lorries of different sizes around the English road system and up

and down steep hills, an increase from 5 to 6 brake horse power per ton of a lorry's gross weight would on average save 78 minutes delay over 1,000 km to cars behind. Mr Everall calculates that the economic benefits of such an increase in terms of reduced delay and operating costs for following vehicles could be as much as £56 in one year from a lorry travelling 50,000 km in present traffic conditions.

POSTGRADUATE TRAINING

Royal Charter for Cranfield

from our Education Correspondent

CRANFIELD College of Aeronautics is to become the Cranfield Institute of Technology and, under its new charter, it will confer degrees on its students. The new institute will be unique in many ways. Not only will it be solely a postgraduate establishment, but it will also be financed by a direct grant from the Department of Education and Science; there is no intention at present to bring it into line with other universities by placing it under the aegis of the University Grants Committee.

The institute will have three faculties: the Faculty of Science, Engineering and Technology, the School of Management and the College of Aeronautics, and the bulk of its research activities will be confined to the fields of aeronautical science and engineering, materials science and technology and industrial administration and management. The institute's organs of government will be similar to those of most universities, but, despite this, Lord Kings Norton, the Chancellor-Designate, says that there is "no desire to be a conventional university". The aim of the establishment will be to provide courses which are loosely integrated with industrial requirements.

The students will usually be drawn from industry—90 per cent of Cranfield students are at present admitted after they have worked in industry and more than one-third are sponsored by their employers. The institute will also continue to accept students with HNC and other industrial qualifications, as well as graduates, but there is no immediate intention to provide undergraduate courses. The new higher degrees

Actual numbers of vehicles in Great Britain for 1960–68 and forecasts for 1969–2010 (from Road Research Laboratory report LR 288).

will take the place of the diplomas which were awarded by the College of Aeronautics, and they will be strictly comparable to corresponding university degrees.

Professor A. J. Murphy, principal of the College of Aeronautics, will be the institute's first Vice-Chancellor and, when he retires at the end of the month, he will be succeeded by Professor A. H. Chilver, who has been director of the Centre for Environmental Studies since 1967.

HORTICULTURE

Banishing the Viruses

from our Botany Correspondent

THE technique of growing plants free of viruses by starting with the tiny growing points or meristems of previously infected plants seems to be coming into fashion. The latest annual report of the Glasshouse Crops Research Institute near Littlehampton (15s) describes a crop of experiments in meristem culture involving various ornamental flowers as well as a potato. The essence of the technique is to subject infected plants to a temperature of 35°–38° C, which upsets the balance between replication and breakdown of the viruses in the host cells. If the meristems are then removed and cultured, some of the resulting plants are free of viruses. Some of the popularity of the technique no doubt derives from the discovery that the yield of many familiar crop plants is depressed by viruses even if there are no outward symptoms of disease.

In the virology department at GCRI, there are now clones of *Chrysanthemum* cultivar 'Mistletoe' free from stunt virus, and of carnation cultivar 'Tangerine Sim' free from carnation etched ring virus 50, all derived from meristem cultures. Similar clones of *Narcissus* cultivar 'Grand Soleil d'Or' are also growing well, free of known viruses. Some of them have flowered, producing more and larger blooms than infected plants. Clones of *Freesia*, free of streak virus, have also flowered. Meristem tips of other *Narcissus* cultivars are growing well in culture. Tulip, iris and hyacinth complete the list of ornamental plants that are in the early stages of meristem culture, and no doubt we can expect to see bigger, better and healthier blooms in the gardens of the future.

The same technique has also been used to produce clean Kenyan potatoes from imported strains which were infected with a virus of the potato Y group and an unknown bacterium. Meristem tips from axillary buds have been cultured to produce clones free of both virus and bacterium, and tubers of these clones are to be sent to Kenya to form a foundation stock.

Investigations of factors which affect the so-called vase life of cut flowers have revealed that 'William Sim' and 'Pink Sim' carnations will droop more quickly if the plants from which they were cut grew in soil deficient in boron. It seems that during the second year of cropping, when boron deficiency tends to build up, vase life can be extended by supplying the plants with the element. Calcium, on the other hand, seems to be harmful in this respect.

Plant hormone enthusiasts should be interested in trials of a new defoliant 'Ethrel' (2-chloroethyl-phosphonic acid). When this compound enters a leaf, it is broken down, releasing ethylene, which promotes

abscission. 'Ethrel' has been tried on various varieties of deciduous shrubs, but results so far compare unfavourably with those obtained with the more mundane potassium iodide.

PHYSICS

Europhysics Journals

THE European Physical Society has adopted the *Philosophical Magazine* as one of its general physics journals, in line with its policy of coordinating European physics publications. The editor, Professor Sir Nevill Mott, will meet members of the publications committee early next year to discuss the formation of an advisory European editorial committee. The other journals which have so far been recommended by the society are the British *Journals of Physics* A, B and C (General, Atomic and Molecular, and Solid State), the Italian high energy journal *Nuovo Cimento*, the French *Journal de Physique*, the Dutch *Physica*, the Czechoslovak *Journal of Physics* and the Yugoslavian *Fizika*.

The EPS intends to start its programme of coordination by concentrating on selected European journals which contain primary articles and are not published by societies. The publication committee of the EPS will attempt to draw up criteria for the journals participating in the scheme which will define the languages of publication, the composition of editorial committees, abstracts, refereeing system and the time lag before publication. It is not yet clear how the system will work in practice or to what extent the EPS will be able to influence the editorial policy of the individual journals.

There will also have to be agreement on more technical details such as page charges, subscription rates and the standardization of size and covers. Of the journals that have been recommended so far, only *Nuovo Cimento* has page charges and discussions are in progress on ways of abolishing them. Each of the recommended journals has the right to use *Europhysics Journal* as an additional title, together with the emblem of the EPS.

SOVIET RESEARCH

Diamond Threads

from our Soviet Correspondent

A NEW property of carbon has been discovered by a team of scientists working in the Institute of Physical Chemistry of the Academy of Sciences of the USSR, who have demonstrated that carbon is capable of being isolated from organic compounds in the form of filament crystals of diamond. A special reactor has been developed in which carbon atoms are "precipitated" from a heated gas on to the surface of diamond monocrystals which act as seeds. Crystals have been obtained of up to 2 mm in length and several tens of microns in diameter. A high rate of growth of the monocrystals is claimed; it is stated that this may even be observed directly with a microscope. No details have so far been given as to the temperature or composition of the gases employed. The research team includes Academician B. V. Deryagin, Dr V. M. Luk'yanovich, Candidates of Technical Science D. V. Fedoseev, V. A. Ryabov, B. V. Spitsyn, and Engineer A. V. Lavrent'ev.