

Not only has the number of large towns more than trebled, but also a marked upward trend in their mean size has occurred. The most spectacular evidence of urban growth is afforded by the millionaire cities. There are now about ninety of these vast agglomerations, of which London and Paris were the only examples a century ago, and their number increases yearly. Some 200 million people now live in these huge cities, and the day is not far off when they will shelter one-tenth of all mankind.

Yet the mammoth cities and existing conurbations do not represent the ultimate stage in the process of urban accretion, for in certain instances groups of these tend to coalesce, forming vast continuous urban areas to which the term 'megalopolis' has been given. The outstanding example is the virtually continuous urban belt stretching for 400 miles from Boston to Washington, D.C., containing more than 30 million people.

Whether in the older regions of settlement or in those of newer development, the expansion of cities is mainly due to the movement of people from rural areas and from the smaller to the larger towns. The townward drift is primarily the expression of a desire for improved conditions of life. In the process no new equilibrium between rural and urban populations is discernible, for food production, despite a dwindling labour force (except in south-east Asia), is increasingly dependent upon technical advances in agriculture. To-day the essential relationship is that between urban demands and agricultural productivity.

The latest phase of urban expansion has had significant effects upon the individual city. The rising importance of service functions of all kinds has substantially altered the structure of urban employment; the growth of administrative and other non-productive activities has intensified the use of the central business quarter; the demand for office accommodation in particular has increased the pressure on building sites, leading to an acceptance of the tall building for such purposes, often in defiance of tradition; retail services have become hampered through traffic congestion and competition for space, resulting in an increased emphasis upon secondary shopping centres in residential districts. In connexion with these and other changes, the controlling factor is motor transport. Its effects are both centrifugal and centripetal, and the capacity of the city to discharge its functions satisfactorily will increasingly depend upon the solution of problems to which this form of transport gives rise.

HOW MUCH SCIENCE ?

THE recent campaign in Great Britain for increasing the proportion of our human and material resources engaged in science, in all its forms, has been supported by a wide range of arguments, some of which are of doubtful validity. What tests can be applied to determine if and when there is a shortage of scientists? It is with this question that Prof. J. Jewkes commences his presidential address to Section *F* (Economics). To the economist the term 'shortage' has an exact meaning. There is a shortage when, at the existing price, the demand is greater than the supply. Although the evidence is scraggy, the indications are that there is no shortage of scientists, in this specific sense, in Great Britain at present. For the salaries of scientists are not at a level nor moving in a direction which suggests

shortage; nor do the latest estimates of probable supply and demand indicate any serious gap between the two.

It is frequently suggested that there is, nevertheless, an 'unmet need', implying that those who exercise the demand for scientists are not sufficiently conscious of their value to the community. Unmet need is an elusive concept, but four reasons have been given for believing that it exists. First, it is said that Britain is lagging behind the United States and the United States behind the U.S.S.R. These international comparisons, when they include the U.S.S.R., are for the most part hazardous statistical exercises with non-comparable material. Even in the comparisons between Great Britain and the United States many obstacles exist, both as to method and materials. It seems to be a reasonable assumption, however, that having regard to their populations, there is no great disparity between the two countries. Secondly, efforts have been made to establish correlations between the rate of change of industrial output and of the number of scientists and technologists in industry. But the statistical material employed here and the deductions based on it both seem to be unsatisfactory. Thirdly, it is sometimes suggested that since some industries spend on research and development relatively more than others, this proves that the second group is lagging. Fourthly, attempts have been made to measure the net gains arising out of expenditure on research and development; the results obtained in this way are interesting but do not support any very spectacular conclusions.

The scale of scientific activities in the community is determined by a very puzzling combination of public and private views, public and private actions and, in the last resort, the striking of the right balance will inevitably be a matter of informed guesswork and of intuition. At the moment the final judgment is probably being distorted by the tendency to exaggerate the part that science has played in raising the standard of living in the past; to over-stress the potential material benefits of the more spectacular recent scientific discoveries; and to belittle the contribution made to economic expansion by skills and capacities non-scientific in character.

THE CRITICAL IMPORTANCE OF TRANSPORT AND COMMUNICATIONS

IN the modern world, transport affects the citizen and the engineer at every turn. In Britain, about 25 per cent of the gross national product is accounted for by transport and communications. Not only is the modern State utterly dependent for its daily bread on transport, but also its competitive power depends largely on its efficiency in operation. Moreover, it is one of the most easily observed aspects of a country's organization and achievement, and it has a psychological as well as a material impact. The subject bristles with technical, economic and political problems, but the aim of Sir Ewart Smith's presidential address to Section *G* (Engineering) is to express some very general thoughts as a challenge to our sense of urgency.

In the mid-nineteenth century, Britain had the best transport system in the world; this was largely the creation of engineers, who not only invented, designed and constructed in the technical sense but also often organized the business sides of the ventures