as a monograph by K. Ray of the Council of Scientific and Industrial Research at New Delhi. While it is certainly difficult to publish census details quickly, there is a strong case for rapid publication of specific surveys such as this, which are important for planning. By now the survey is interesting only as history. In 1961 the survey showed that there were 250,000 qualified graduates in science, technology and medicine in India, of whom 6·5 per cent were women. For every 100 scientists there were 75 engineers (the United Kingdom has 130 engineers for every 100 scientists, and the United States has 250). The deployment of these graduates comes as something of a surprise; 18·6 per cent had found non-technical work, and more than 10 per cent were unemployed, although the census was carried out at the time of year when graduate unemployment in India is at a minimum. Of those who said how long they had been unemployed, more than one half had been out of work for more than a year. As the census points out, it is difficult to reconcile the high rate of unemployment among doctors (7·3 per cent) with the fact that in India there are 6,000 people for each doctor. The unemployed could best be offered the opportunity of becoming teachers, of which India has a particular need; but perhaps by now they have all found jobs.

Doubt and Mistrust

STIRRINGS of discontent within the National Trust have come to a head with the dismissal of Commander Conrad Rawnsley from his post as Appeals Director and Director of Enterprise Neptune. Enterprise Neptune was conceived as a means of saving Britain's coastline from indiscriminate development, and has raised a large sum of money for this purpose—£900,000 by the trust's reckoning, and more by Commander Rawnsley's. In recent months, costs of the appeal have amounted to 20 per cent of receipts, which the trust considers to be too high a price to pay, and which is why the trust decided to absorb the appeal into its general administration. Commander Rawnsley disagrees: "It could have gone on to raise by the end of May 1968 £3 m at an overall cost of 7 per cent—an all time record low for an appeal of such a nature".

Certainly the trust is ill-equipped to cast itself in the role of a pauper. Since its foundation in 1907 as a means of preserving places of historic interest or natural beauty, it has grown into the third largest landowner in Britain, possessing 350,000 acres of land, investments worth £7 m and 200 historic houses. On the face of it, this looks like good management, but the Reform Movement headed by Commander Rawnsley disagrees. Under the banner of Enterprise Neptune they have mobilized a small army of supporters. Nobody quite knows how many.

On the one hand, the objectors say that the trust is undemocratic, and that its committees are self-perpetuating cliques appointed by head office. Even the local committees, they say, are unrepresentative, and there is no devolution of power. The trust already concedes that "an increasing decentralization is called for". On the other hand, the objectors claim that the trust is an inefficient manager, landower and employer, and that the annual accounts are deliberately obscure. Only where the great houses are concerned do the reformers feel that the trust has done a good job; they feel, however, that preservation as in aspic may be appropriate to great houses, but is quite inappropriate to areas of land. They want to see more development of the land, with freer access for the public, and the creation of proper camping sites.

These objections go far beyond the pique of a dismissed employee, and in fact reflect a difference of attitude as to how the trust should be run. They will be put in the form of motions to the extraordinary general meeting which the reform movement has called on February 11. Whatever the result, the controversy will do the trust no harm, and may lead to a situation in which ordinary members feel more involved in its work. In any case, the fuss is likely to have a healthy effect on recruitment.

Mathematics and the Mantle

SPHERICAL harmonic analysis has been used in the past by the proponents of continental drift to try to demonstrate that the figure of the Earth is related to convecting cells in the mantle. This approach—which considers the Earth's topography as a whole—has not been entirely satisfactory so far, because the contribution of the principal tectonic features to the analysis is obscured by the steep slopes of the continental margins. In an attempt to overcome this difficulty A. M. Coode (*Geophys. J. Roy. Astro. Soc.*, **12**, 55; 1966) has ignored the continental features and has analysed only recent tectonic features—oceanic ridges and mountain-trench systems. Because the features chosen for analysis are roughly of the same age, any confusion which arises from a temporal change in the mechanism which generates these features, and therefore a change in the features themselves, is avoided. Assuming that the ridges are tensional and that the mountain trench systems are compressional features, Coode demonstrates that the principal tectonic features of the Earth are related to a global generating mechanism of the fifth degree. Following Runcorn, he interprets the mechanism as one of a convecting mantle and also supports the hypothesis that the pattern of convection has recently changed from a dominantly four-cell to a five-cell pattern.

Mind and Gene

SOME of the problems of the links between psychiatry and genetics are discussed in *Research on Genetics in Psychiatry*, the report of a scientific group of WHO. There is clear evidence that genetic factors are involved in the aetiology of a number of mental diseases, although the genetic factors are more obvious in some than in others. Huntington's chorea is the best example of a hereditary mental disease—family trees showing very clearly the inheritance of a single dominant gene have been compiled for a number of families in which the disease is current. In most of the more common mental diseases, schizophrenia, epilepsy and manic-depression, for example, the genetic component is far less clear cut, although it probably plays a considerable part in most of these states. The lack of a standard international nomenclature only adds to the intrinsic difficulties of these studies.

Understanding of the two general categories of mental disease is at very different levels. Mental

defect has been studied by a number of fruitful techniques and its genetic aspect is much better understood than that of mental disorder. A number of syndromes arising from chromosome defects, such as Klinefelter's syndrome (the presence of an excess sex chromosome) and Down's disease (21-trisomy), are well characterized. Not surprisingly, what the report calls "mental retardation of unknown aetiology" is poorly understood, although here the statistical methods of population genetics can be of great value. These methods have made it possible to divide the cases of retardation into two main groups—one in which it seems that there is a strong genetic involvement and one with a low risk. Genetic factors are responsible for many cases in the group at high risk. These include at least one chromosome abnormality and a number of single recessive genes with high penetrance.

The WHO group puts forward a number of proposals for topics on which work should be concentrated. It calls for research into the frequency of chromosome abnormalities and the relationship of these abnormalities with mental disorder, particularly from the biochemical point of view. It would like to see more work on twins, preferably on an international scale, including studies of twins separated in early life, and on adopted children and their families. It also thinks workers should hurry to examine inbred populations before they are submerged by admixture and the spread of urbanization.

New Ghost Town

THE new town promised by the Minister of Housing and Local Government in North Buckinghamshire will not only be the largest in the United Kingdom but probably the most diffuse as well. By the end of the century it will hold 250,000 people from London at an overall density of about 11 to the acre. Most of the new town, to be called Milton Keynes, will be between the trunk roads M1 and A5, and it will absorb the existing towns of Bletchley, Wolverton, and Stony Stratford. The original plans specified an area of 25,200 acres, but the report of the public inquiry conducted by Mr. G. C. Godber, an independent inspector appointed by the ministry, has persuaded Mr. Greenwood to reduce this by 3,300 acres. Observing that the site is roughly as large as Bristol (population 434,000) and substantially larger than Coventry (327,000), the inspector reported that "The objectors were not convinced and I am certainly not convinced that it can be right to take so low a density as a target . . . One thing is certain—the plan will fill whatever land is designated, and it is not right to sacrifice good farms and good farmers needlessly to make a planners picture."

Not all the planners are cock-a-hoop at the opportunity offered by the minister, however. There are two schools of thought—at least—on town density. One, in which architects are conspicuous, holds that high densities are necessary both as a discipline and to create what is known as urbanism (or occasionally urbanity, although that is usually taken to mean something quite different). This point of view is coloured by sociological studies such as that of Michael Young and Peter Wilmott—*Family and Kinship in East London*—who showed that when people are moved from a close-knit community (Bethnal Green) to a suburban housing estate (Woodford), their strong sense of community is left behind. Among the greater population densities used, with the support of many local authorities and the Ministry of Housing, is that at Cumbernauld new town in Scotland, where 85 people are housed on each acre.

The other point of view is probably put most forcefully, and certainly most often, by the Town and Country Planning Association, whose attack is directed chiefly at flats, which are said to be unpopular with tenants, and more expensive to build and maintain than houses. Certainly the association is convinced that only about 5 per cent of British people want flats, and that even this minority taste is probably declining. Bungalows, semi-detached and detached houses vie for popularity. To those for whom this presents a doleful vision of mile upon mile of suburban houses and bungalows, combining the worst features of American urban sprawl and British design, the association says that urban sprawl is not necessarily the result of low density housing but simply of bad design.

The aesthetic and sociological argument is a fascinating one, but may become an irrelevance, if it has not already done so. The South-East Study (H.M.S.O., 15*s*., 1964) estimates that the population increase of South-East England is likely to be 3·5 million by 1981. Housing this increase in towns as thinly spread as Milton Keynes would need an area of about 310,000 acres—greater than that of Bedfordshire. Nobody dares to think about A.D. 2000, when the new town will have reached its leisurely target.

Cinnabar with Everything

THE production of gold from base metals has long been known as the ambition of the alchemists, but they had another preoccupation—the lengthening of life. Chinese alchemy in particular was almost totally dedicated to this end, as can be told from *A History of Ideas about the Prolongation of Life* (*Trans. Amer. Phil. Soc., N.S.*, **56**, part 9; 1966).

One of the principles of the Chinese alchemists was a kind of vitalism, which implied that certain substances contain the essence of life and can be used to produce medicines which help to prolong it. Certain characteristics were considered necessary for a substance to be a vitalizer; these included being shining, fluid, strong to the taste and blood red in colour. The alchemists had a list of materials which possessed the vitalizing property, and there was a heirarchy with minerals at the top and herbs at the bottom. Drugs of vegetable origin were inefficient vitalizers; they can only decompose and decay, but the minerals had many of the necessary characteristics. The most valuable were the rare minerals. Silver, gold and cinnabar were at the top of the list; mercuric sulphide occupied a supreme position in Chinese alchemy, although it was only of minor importance in other cultures. Cinnabar had the blood-red colouring which bestowed life giving qualities, which were already recognized, for neolithic people in China had deposited vermilion pigment with their dead. The change of cinnabar, on heating, to mercury, and the conversion of this to mercuric oxide which sublimes back to mercury, showed the alchemists a seemingly endless cycle involving "living" red cinnabar and "living" fluid mercury. This represented longevity, which