

**CREATIVE  
DEMOBILISATION**

*Vol. II :*  
**CASE STUDIES IN  
NATIONAL PLANNING**

# INTERNATIONAL LIBRARY OF SOCIOLOGY AND SOCIAL RECONSTRUCTION

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# CREATIVE DEMOBILISATION

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*Volume II*

## Case Studies in National Planning

*Edited by*

E. A. GUTKIND

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## PREFACE

THE following memoranda deal with some selected case studies of national planning. They express the personal opinions of their authors. They should be considered as an essential interpretation or illustration of the approach to national planning indicated in the first volume. The formulation of general principles must be supported by the sub-structure of actual case studies. Both are complementary to each other and of equal importance.

The contributions are grouped similarly to the main chapters of the first part. The memorandum on "Some Social Aspects of Industry in Relation to Planning" and "The Questionnaire on Industrial Localisation Factors" are staff work of the Demographic Survey and Plan as well as the last three memoranda. A brief comment is, however, necessary with regard to the chapter on "Ill-balanced Communities". This memorandum is based upon the premise that the combination of agriculture and mining is not compatible with modern conditions. This might be true if one thinks of the archaic method of giving small allotments to the miners. Yet this approach touches only one side of the problems involved. It is suggested, therefore, that detailed investigations should be conducted for every mining *region*—not only for the individual mining community—with the aim of gaining more factual knowledge as to the relationship between agriculture and mining under *modern* conditions. First, we must think in terms of regional and not of local possibilities. Secondly, we must take into account the technological development in coal-mining and the potential displacement of labour. Thirdly, the trend towards fewer and larger enterprises is also of importance. These are only some of the factors which have a decisive bearing on the reorganisation of the structure of settlement in mining districts. Valuable material, in this respect, can be found in American publications and especially in the Report of the National Resources Committee, "Technological Trends and National Policy". On the other hand, corresponding adjustment in the agricultural field is likewise to be expected. To dismiss a combination of agriculture and mining as "archaic" would not do justice to the problems which are inherent in national planning. We should await the results of unbiased research before we arrive at definite decisions. In any case we must think in terms of potential future development in both agriculture and mining and not try to solve this problem by expecting help from the past.

All other chapters are voluntary contributions towards the

work of the Demographic Survey and Plan by experts who are especially interested in the problems of national planning. I wish to express once more my thanks for the readiness with which they extended their help to our work.

It should be emphasised that only selected Case Studies could be presented. It was impossible to cover the whole field of national planning. Its scope is too vast and much detailed research work is needed before definite conclusions can be drawn.

Just as the contents of this volume are the indispensable complement of the first one, so the various memoranda of each group are complementary to each other and should be considered as an entity.

The "Extract from some American Publications"—Appendix A—is no more than an attempt to convey some knowledge of the experience gained in U.S.A. which is of special significance to national planning. The "Data concerning the Structure of Typical Towns" might be a starting point for investigations as to what is a sound or ill-balanced community. This knowledge is an essential prerequisite of a redistribution of population and industry.

Without the help of the 1940 Council and Mr. G. L. Pepler of the Ministry of Works and Planning it would have been impossible to compile the material contained in this volume.

It is not for me to claim any credit for this volume. In this case I am only the editor, though I share the responsibility with the authors of the various memoranda in so far as I suggested some of them or asked for special permission to include others in this book.

E. A. G.

LONDON,  
*July 1942.*



# HUMAN GEOGRAPHY

## THE ENGLISH COUNTRYSIDE AND HUMAN REACTIONS TO SCENIC CHANGE

by

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AS there is great public interest in recent and possible future uses of land, and—in certain sections of society—fears of changes in present uses and scenic conditions, an attempt to examine some of our mental attitudes to landscape and to scenic change may be useful.

Mr. Geoffrey Boumphrey<sup>1</sup> has provided a convenient analysis of the main features of "the spoliation of the countryside". "First and most serious, comes the complete loss of countryside" to food production "owing to its absorption into towns and suburbs". Second, "perhaps less serious in its effects on food supply but far worse—because more widespread—in its damage to the beauty of the countryside and its influence on rural life, has been the tendency of town workers to abandon the towns, where they earn their daily bread, and live in homes built to suit their dubious tastes here, there and everywhere far across the countryside". "The third category of country despoliation is perhaps due almost as much to the presence of these town-countrymen as to the periodic influxes of townfolk and suburbanites on pleasure bent for which it attempts to cater. It includes such things as advertisement signs and hoardings, untidy garages and petrol pumps, tea-shops, and all that range of enterprises which deface the very charms they rely on to attract their customers."

There are other causes of changes in the rural scene such as road-making and road-widening and occasionally the establishment or extension of industrial works. The outcry against building pylons to carry electric cables across many countrysides will be easily remembered. And there have been bitter complaints about changes in scenery caused by planting large areas of coniferous trees in districts where other types of woodlands have hitherto prevailed.

But the pressure of urban and suburban development, especially

<sup>1</sup> *Town and Countryside Tomorrow*, pp. 27-9.

of unco-ordinated character, seems to be the chief cause of fears, Mr. Thomas Sharp<sup>1</sup> has written :

The maintenance of sharp dramatic contrast, the emphatic physical distinction between these two antithetical forms (of town and country) is of the very greatest value in promoting the happiness of the inhabitants of a country so heavily populated as England is. The thrill of passing from one to the other is one of the oldest and most fundamental excitements which civilised man has known. And that thrill is real escape too : when wearied and overborne by one utility, to be able to pass quickly, suddenly into the other without the discouragement and fatigue of a slow transition—that is the real, the genuine escape.

Such statements as have been quoted themselves arise from mental reactions to scenery and changes therein. But in order to examine the general range of mental reactions to scenery and scenic changes it appears necessary to define some of the terms which may be used.

#### I—APPRECIATION OF THE COUNTRYSIDE

The sum of what we mean by Nature includes earth shapes and colours ; water and its movements ; air temperatures and movements ; cloud shapes, colours, and movements ; sunshine, moonshine and starshine in all their degrees ; with flora and fauna in all their varieties and activities.

What we mean by *Natural Scenery* covers the same items with the fauna as minor elements. What we mean by landscape covers the earth part of this, with established works of man and sometimes human beings themselves added. Earth forms and colours with vegetation and the works of man added are the major elements in landscape. But distinguishing *Scenery* from *Nature* we change the character of our appreciations and it is with shapes and colours that we are primarily concerned, yet nearly always with elements of some of the other factors. Scenery is mostly passive and does not reach out to man : man has to reach out to it by self-projection. The scene is passive, until the wind blows, rain falls, or a blackbird begins to sing.

What we call "love of nature" takes many forms and degrees. In its most generalised form it is rather feeling for scenery than for nature in the broader sense. But the interests of individual "nature lovers" are often specific ; they are centred in birds, flowers, other plants or trees ; even in items less significant to the general mass of people than these. It appears that in the mental evolution of man "love of nature", in the sense of an affectionate feeling for scenery, has arisen largely from severance

<sup>1</sup> *Town Planning* (Penguin), p. 55.

from it and out of freedom from constant and involuntary association with it. This is not to suggest that detachment is necessary for affection but in this case "absence" often "makes the heart grow fonder". While freedom of choice may not be necessary in the development of affection for scenery, the looser the bonds of necessity the greater the affection in so far as this is separable from other interests.

The elements in individual appreciations of natural scenery may vary from few and simple to many and complex. Prominent amongst them are forms and colours, utility bearings, current associations, memory associations with comparisons and contrasts, especially of forms and colours and utility bearings, in other types of scene. Those who get most out of a landscape, or piece of natural scenery, are those who "can read most into it", or select their own pictures out of it. Non-utilitarian interests in natural scenery, tastes for certain types of it, are frequently developed directly and by reaction from the study of pictures, and, in these days, of photographs and films, and directly from literature, especially from prose. Different persons looking at a landscape at the same time have different impressions of it. The eyes and mind of one working together select certain points or features, concentrate interest on them and pleasure (or occasionally displeasure) is derived from these. The eyes and mind of another will select certain other points or features, and pleasure is derived from these. One, it may be, concentrates on human habitations or church spires, another on trees or woodlands, still another on the bends of a river. For each subject there may be unity in the total view, and pleasure may be equal; but the foci of their pleasure sources are different.<sup>1</sup>

Feelings about scenery are often inflated by verbal descriptions. Prose descriptive of natural scenery frequently starts at the subjective stage, projects feelings on to the scene, from whence they return to the subject in increased intensity. The poetry of natural scenery is on the whole very much more objective than prose descriptions, but this seems to be due to the necessity for brevity of statement in the effective poetic forms. When nature poetry becomes subjective it takes the simpler elements of human nature and of nature for identification one with the

<sup>1</sup> It has been said—"The eyes of the artist commonly find a centre of interest, with subordinate elements of interest, and much that is within the field of vision is unperceived. Often the eyes see a central image, see it with imaginative vision, and see all else in secondary relationship." It has also been said, but I think incorrectly—"The eye of the countryman when directed to scenery is often more like the lens of a camera than the eye of an artist: it sees meticulously, mechanically, without conscious selection of parts within the field of vision, without subordination of parts and without imagination. It sees everything in its field, all at once, with equal distinctness, equal significance, equal claim to attention."

other or for the display of reactive influences. The foundation of much of the nature poetry is observational. Descriptions of relations between man and nature in modern prose are frequently extended and subtle; they are intellectual and imaginative rather than observational in character. While they rest on a basis of scenes seen or remembered, their essential character is that of scenes contracted, expanded or embellished, commonly the latter, and in these processes distorted.

Conscious appreciation of landscape obviously is cultivated, and the more thought-elements it contains the more cultivated it must be. Primitive man, apparently, had no special æsthetic appreciations of landscape. When he began to paint and draw, etch (scratch) and carve, he was concerned with human beings, animals and symbolic objects. It is true, of course, that portrayal of landscape would be beyond the technical capacities of the artists amongst primitive man, but apparently there is little if any suggestion of it in their artistic essays. The earliest forms of portrayal of scenery seem to be largely symbolic and while this may be partly due to the technical difficulties of representation, it is also indicative of interests.

In modern man the appreciation of natural scenery is of slow growth in the individual. It starts at different ages and in many cases is not very strong or clear until puberty or thereabouts. It grows with the expansion of associations in numbers, and variety, and with cultivation by acquaintance with æsthetic expression.

Browning wrote :

“ You’ve seen the world  
 —The beauty and the wonder and the power,—  
 The shapes of things, their colours, lights and shades,  
 Changes, surprises . . .  
 This fair town’s face  
 Yonder river’s line  
 The mountains round it and the sky above,  
 Much more the figures of man, woman and child,  
 These are the frame to ?  
 What’s it all about ?

---

We’re made so, that we love  
 First when we see them painted, things we have passed  
 Perhaps a hundred times nor cared to see :  
 And so they’re better, painted—  
 Better to us,  
 Which is the same thing.  
 Art was given for that.”

(*Fra Lippo Lippi*)

The remarkable thing is that appreciation of "pure" landscape (i.e. natural scenery), apart from settings for the works of man or for man himself, amongst painters, is a relatively modern development. It is associated with the rise of the literature of nature from the eighteenth century onwards and both are associated with the severance of a large part of the population from continuous and compulsory association with the land.

Amongst the elements creating or drawing interest in natural scenery and its associated conditions are:<sup>1</sup>

- (1) Utilitarian interests—uses and possibilities of uses for agricultural and pastoral production, quarrying, mining, water and power supplies, other industrial uses, residential sites, commercial exploitation of recreational attractions.
- (2) Interests of craftsmanship in the creation, management, mismanagement, of certain features which the activities of man and natural forces have combined to make. There are also suggestions of pattern and rhythm which appeal to certain craft interests.
- (3) Physiological values to man of certain types of natural scenery and associated conditions of air and light and disadvantages of others. There are effects of physiological character in bracing and depressing atmosphere, and these carry with them certain influences on mental states. Distant views and the focusing of eyes on distant objects affect mental states in ways having elements of physiological change.<sup>2</sup> Different degrees of light and shade exercise lifting and depressing effects on mental states. A combination of strong light and moving and bracing air is physiologically stimulating in pleasant ways. Opposition of certain elements such as rain or wind causes muscular and mental effort which may be pleasant or painful under different circumstances. The presence of haze or mist calls for special efforts of eyes and ears.
- (4) Certain natural conditions like haze and mist and light fog fit with some conditions of man, such as moods and

<sup>1</sup> "With civilisation, with increased safety of travel, and the multiplication of the arts and sciences of peace, the region of recreation expands, and the more various become its attractions of scenery, sport, natural history, and travel or vagabondage for their own sakes."—Edward Thomas, *The Country*, p. 32.

<sup>2</sup> "Loneliness descends upon the solitary wanderer" (in the plain). "Wandering in the mountains never induces loneliness, because they limit the flight of the human spirit, but in the plain that loses itself in the blue horizon there is infinity."—Starkie, *Raggle Taggle*, Ch. 22 (p. 104 of Guild Books Edn.)

temperamental attitudes, between those which are definitely physiological and more definite states of mental activity. Dimming and smothering effects arouse response towards appreciation of mystery or its exploration and dispelling.

- (5) The newer psychology would suggest that some interests in natural scenery, in shapes, and in suggestions of underlying features and forces are related to interests in the human body. Suggestions of a geological skeleton and of curves similar to those of the human body are supposed to arise in the vision or contemplation of certain landscape forms.
- (6) Effects of certain textures and their similarities or contrasts with textures encountered in other spheres of life.

Elements in natural scenery which appeal to the more purely æsthetic interests include—

- (a) Shapes in all their variety,  
 (b) Colours in all their variety and in both harmony and contrast,  
 (c) Effects of light and shade,  
 (d) Effects of dimming and softening as by haze and mist,  
 (e) Effects of pattern, symmetry and balance,  
 (f) Effects of rhythm,  
 (g) Silhouette effects,  
 (h) Effects of certain textures.

In considering æsthetic aspects of landscape it is necessary to distinguish two different things—the appreciation of landscape which is subjective feeling and thought and the creation of it which is an æsthetic activity. There are many connections between these. Contemplation and analysis of consciously designed scenery will affect appreciations of forms which have arisen in other ways. Extensive acquaintance with natural scenery will affect appreciations of consciously created landscape.

Natural scenery is turned into landscape, i.e. natural scenery containing works of man, in the process of obtaining foodstuffs with raw materials and comfortable conditions of living, according to the means available to individuals, families and social groups at any given period, and also according to the ideas current in society at such periods. Different individuals and social classes or groups, such as villages, mining communities, and cities, have various modes and means of obtaining subsistence and conditions of comfortable living, different ideas as to the relative importance of various material utilities and æsthetic satisfactions. Variations in means of obtaining conditions of comfortable living<sup>1</sup> have to be kept clearly in mind

<sup>1</sup> Modes of work, incomes and general opportunities.

in the consideration of the types and degrees of æsthetic satisfactions which are to be sought. If the individual has not the means to attain the minimum æsthetic standard which society deems to be desirable, society must supply them.

With reference to the preservation and creation of rural beauty in the post-war world, Clough Williams Ellis <sup>1</sup> has clearly recognised the possible influence of social class—

Many exquisite things that we have treasured will certainly be roughly handled. . . .

To begin with, the future is not likely to concern itself with visual beauty, its creation or preservation, save with reference to its total human values. . . .

That, I think, interprets the utilitarian feeling of the times. . . .

With eight out of every ten Britons town-bred, many barbarously reared in far other than splendid cities, having had little contact with graciousness of any kind and therefore knowing or caring very little for it, their introduction to it is hazardous. For who is likely to respond appropriately when presented to the hitherto unknown?

Similarly, Mr. Geoffrey Bumphrey <sup>2</sup> says :

The great danger is that the preservation of beauty may come to be regarded as a class issue. Already many local authorities include members of a less cultured sort who have suffered real or imaginary slights, and are therefore ready to adopt an antagonistic attitude whenever any question of æsthetics crops up. To them beauty is an impracticable quality treasured only by snobs.

Any such statement shows clearly the class basis of the "æsthetics" concerned. For the conflict is not only between utilities and æsthetics, but at some stages much more acutely between one set of æsthetic values and another: that is between those of the few and comparatively rich and those of the many and the poor.

Mr. Thomas Sharp <sup>3</sup> emphasises the possible conflict between private and social interests—

Private interests are already so using the new developments (of transport) that the old utilities are being completely changed, and the spreading suburbs, the thin scatterings, the ribbons, the single house that selfishly dominates a whole landscape, are coming into being, not because they represent the best use of the new developments for the general good, but merely because in the absence of any clear public programme it is natural that every individual should seize the new developments for his personal exploitation, regardless of what may be the effect of his actions on the general welfare.

<sup>1</sup> *Country Life*, 19th September, 1941.

<sup>2</sup> *Town and Country Tomorrow*, p. 30.

<sup>3</sup> *Town Planning* (Penguin), p. 46.

It is, however, necessary to add that the welfare of the appropriating individuals is a part of the "general welfare" and that negative action which merely restricts their activities may reduce the general welfare. If the "general welfare" is to be secured in this case it will need active promotion in many and varied ways.

## II—THE ENGLISH SCENE AND AGRICULTURAL INTERESTS

Simplifying English rural history as most people do, unjustifiably, both Boumphrey and Sharp attribute a great part of the English scene to the land enclosers of the eighteenth century, when in fact the fence lines of England were made any time between A.D. 1300 and 1850 but mostly between 1480 and 1850.

Thus Mr. Boumphrey: <sup>1</sup>

The England we all love, which is unrivalled in its own particular beauty by any country in the world [is] the creation [of] the eighteenth-century landscape gardeners.

Mr. Sharp says that by the first years of the eighteenth century it had become obvious that the old agricultural methods of the common-field system were now quite hopelessly inefficient for producing the nation's food. . . . The more rational distribution of the land was a mere matter of the alteration of the shape and size of the parcels. That alone need have made little difference to the appearance of England. But the desire to make a landscape that was more than economically efficient, that was in fact a home as well as a workplace, was there so strongly and vividly, awaiting merely an opportunity of expression, that, the opportunity occurring, the use of it for æsthetic purposes was at least as important in the mind of the eighteenth-century Englishman as its economic and political possibilities.<sup>2</sup>

Now it must be suggested that this is mainly imaginative history. The boundaries of the new parcels of land were often fixed by Enclosures Commissioners and it is very doubtful whether they ever thought of æsthetic principles, they had sufficient of other considerations to bear in mind. (See Appendix, p. 20.) The chief of the æsthetic planning was done for and in parks, where utility and economic efficiency were sacrificed to beauty, privacy and economic and social display, privacy and display of wealth being quite as important as the creation of sources of æsthetic satisfactions. Indeed, the arrangements to secure privacy for the individual family often denied beauty to the

<sup>1</sup> *Town and Country Tomorrow*, p. 64. There are several other passages dealing with the creation of rural beauty, as at pp. 40 and 63.

<sup>2</sup> Sharp, *Town Planning* (Penguin). But there is a fuller discussion of this subject in Mr. Sharp's *Town and Countryside*, Ch. 2.



general public. The high walls and belts of trees round parks and some whole estates are well known.

Standing at a vantage point and viewing the panorama in many parts of the country, the general scene will be found attractive. It has many elements of beauty blended in one satisfying presentation. But on starting a process of analysis it will be found that there are lines and shapes that are incongruous, lacking harmony. This is particularly the case where there are few trees in the fence lines. When the fences are heavily timbered the contours of the soil are always broken and softened and sometimes the lines made by the timber become dominant over those of the surface of the earth itself. Where trees are scarce and the fence lines were set for reasons of utility and convenience, and sometimes by legal and historical accident, they frequently break all the principles of the relation of one line to another. But in spite of this the scene comprehended as a whole is attractive and satisfying.

In hill and mountain scenery there are frequently two entirely different conditions of observation. In broad and comprehensive view the natural contours and the large patches of subdued colour or of light and shade dwarf into insignificance any works of man that are seen in detail in the near view. Then commonly in the close intimate view it is mainly the works of man that are seen. There are many attractive drawings, paintings and photographs of hill and valley scenery in which nearly the whole of the significant detail is of the works of man.

Strangely enough Mr. Boumphrey himself has assessed the working countryman's point of view regarding the æsthetics of the landscapes in which he works.

The countryman's attitude towards design itself is essentially realistic.<sup>1</sup> . . .

The real country worker's outlook on his environment is almost invariably realistic. He may appreciate its (the countryside) beauties subconsciously, but his conscious mind is generally too occupied with practical considerations to pay much attention to æsthetics.<sup>2</sup>

Sir Daniel Hall has stated both agricultural and combined agricultural and æsthetic points of view :

Many parts of England from a distance look to be pure woodland, so numerous are the little patches of wood and the lines of trees along the hedgerows. The hedgerow trees have mostly "happened", the little plantations sometimes are meant to provide shelter for cattle, more generally they are coverts for game ; and only in certain districts are there true woodland areas, managed for timber. Too

<sup>1</sup> *Town and Country Tomorrow*, p. 29.

<sup>2</sup> *Ibid.*, p. 39.

often the hedgerows and the small woodlands are mere nuisances to farming, harbours for rabbits, pests and weeds.<sup>1</sup>

What angers one (for farming and apparently for æsthetic reasons) is the multiplicity of patches, perhaps no more than a few acres in extent, of neglected, overcrowded trees intruded on to good farming land; even from the point of view of the picturesque they destroy the noble contours of the ground. Æsthetically considered, too much of our land looks overcrowded and fidgety; it may well be rendered simpler and of wider sweep, even if it loses something of its snug "comfortable" aspects.<sup>2</sup>

### III—THE PSYCHOLOGY OF SCENIC CHANGE

In looking at our countryside we need to remind ourselves very frequently that most of what we see is the product of man's activities. Only the contours of the land surface, lakes, and the lines of the rivers and brooks are "natural", that is, exist as they were before social and organised man began his activities on the land. The roads, the timber, the hedgerows, the vegetation, nearly all the things which fill the eye and give pleasure or pain as the case may be are the results of man's activities and the reactions of nature. Action and reaction are continuous but man supplies the chief dynamics. Apart from the contours, and occasionally the sheen of a lake or the sweep of a river, the most interesting and attractive items are the work of man. The winding road and its vistas, the curve of a bridge, or soft-red-tiled roof between the trees, the changing colours of the fields with time and season—these are the work of man. Even the seasonal colour changes of the hillsides arise from the inter-relations of the activities of man and nature. These things are not only often good: they are generally accepted. It is in more drastic or more dramatic changes that it is supposed "man scars the earth". Every time a project of making a new lake is mooted there is an outcry. Yet few who have seen the Elan Valley or Lake Vyrnwy, or the lake at Trawsfynydd would doubt that man's activities there have added to the interest and the beauty of the countryside.

Quarries are often said to be "blots on the landscape", "wounds on the body of Mother Earth". But for some persons at least there are quarries which add to the interest and the attraction of the landscape and even to the æsthetic pleasure of vision, though perhaps it may not be said they add to the beauty

<sup>1</sup> As regards changes in appreciations of landscape: "Man's enthusiasms and opinions and passions are subject to frequent and sometimes violent change, but in so far as his relations to his physical environment are concerned, his activities must be steadily maintained from month to month and year to year. Each season the grain has been sown and the harvest reaped with more or less success. There has been no break in the recurrence of agricultural operations."

<sup>2</sup> *Reconstruction and the Land*, p. 188.

of the views of which they form parts. It may be that interest arises from the abrupt change of line, or out of a dramatic difference from the near environment. There is sometimes interest in variations of colours of strata within the quarry itself, often between the quarry and its immediate environment, and interest in the differences of textures and their effects between the quarry and nearby land surfaces and vegetation. There is also interest in the revelation of the strata underlying the surrounding territory and maybe, occasionally, interest in the suggestions of skeleton and flesh curve previously mentioned. Pathos, which is an element of interest and appreciation in picture and sculpture, in poetry, song and drama, appears very little in our relations with scenery. But it arises in the contemplation of a blasted tree, and it may be present when we see a quarry. Some people may be more anthropomorphic than others and see in quarries reminders of the blasting of quiet life, of quiescent beauty, which has never been entirely avoided by nature and rarely by man. Even to quarries we attach the pleasures of familiarity and the satisfactions of still living but half-forgotten associations. There are many quarries that have their human admirers and friends.

When modern man thinks of the existing beauties of the countryside he is commonly in his most sentimental, most conservative, least rational mental state. What he sees before him is beautiful, anything else which might be on the same site would be less beautiful, even likely to be positively repulsive. Familiarity is one of the main sources of satisfaction of the country people with their environment, and one of the main foundations of the estimates of beauty by townspeople in their relations with the scenery of their own regions.<sup>1</sup>

What residents of a region, whether town or country people, see in its scenery is partly in their own minds. Beyond the visual familiarity there are many automatic associations of the external scene with previous sensory and mental experiences. Pleasurable associations which have once endowed a scene or a type of scenery with interest or beauty stamp its pattern on the memory and the pleasure is renewable. Even externally unpleasant relations like battling with a storm or a soaking of rain may end in mental satisfaction and the final association may be one of pleasure.

Visual familiarity, "the friendliness of known things", together with sentiments from previous direct associations between the

<sup>1</sup> It has been said that "privacy and surprise are the two prime qualities of a civilised landscape" (Fleming, *Travels in Tartary*). In public places these are prime qualities to a traveller and perhaps more particularly to a walker.

individual and certain of the elements in the natural environment, or associations between person and person, sometimes between the person and the community, within the particular scenic environment, are the main foundations of appreciation of beauty in the scenery of any region by its own residents.

This does not account for the appreciation of beauty in another type of natural scenery by the residents of one region. Here the source of appreciation may approach the pure æsthetic—the appreciation of line and mass and colour. But appreciation is more likely to arise from feelings of relief, of contrast, and of release. To nearly all sensitive people up to middle age, to some people at all ages, continued familiarity breeds dullness and occasionally, when curiosity has been stirred, resentment. A temporary change of scene is enjoyed because it satisfies curiosity, because it gives relief from a dullness of familiarity, or because it gives release from human associations. But the pleasure of the change soon wears off and there is nostalgia for “the old familiar things”.<sup>1</sup> Many country people who have changed the scenic environment of their youth for another suffer a lifelong nostalgia. Quite commonly it is only the slow building of varied associations which makes for country people a new scenic environment first endurable, then pleasant, and finally beautiful. For migrant farmers and farm workers the rational elements of economic interest make new scenery endurable, only the building of another set of associations makes it pleasurable.

It is chiefly the real city dwellers, the city bred and nurtured, and members of the middle and professional classes living in the country, who have anything approaching æsthetic freedom in their appreciations of beauty in scenery, although there are some other people from the smaller towns who had the advantage of early experience of several varieties of scenery who have considerable freedom.

The young hiker from the city may have a keen appreciation of line or mass or colour, a positive appreciation of fresh air, olfactory nerves sensitive enough for pleasurable stimulation by country smells, but he has also sensations of relief from restriction of vision, perhaps of relief from positive ugliness, he may have relief from a positively oppressive atmosphere, he often

<sup>1</sup> “Strangeness in itself can exercise an æsthetic charm. At the same time it can repel us. It seems as though a complete enjoyment of beauty is only possible when we are confronted with a work of art which either belongs to our own kind of culture, or is at least superficially related to our own ideals of artistic beauty. The combinations of form and colour evolved by foreign civilisations may have many attractions, but they remain shrouded in an uncanny, mysterious atmosphere which is entirely alien to us.”—L. Adam, *Primitive Art*, p. 17.

has a sense of release from personal and community associations.<sup>1</sup> If these sensations are associated first with one type of scenery, then with another and another, his appreciations may become truly catholic, and the more purely æsthetic foundations of appreciations may rise in importance. If, however, such sensations are frequently associated with one type of scenery appreciation is likely to take a definite set towards that type.

Even with the most catholic types of appreciation an element of conservatism very quickly develops in attitudes towards known scenes or known types of scenery. Once a set of pleasurable associations has been fixed, for even brief periods, what is known is pleasant, the prospect of anything else on the same site is not so pleasant and may be positively repulsive. This conservatism is due to a failure of imagination. In many, perhaps most, cases there is failure of visual imagination. A proposed new item in a known scene cannot be visualised in its true lines, mass or colour in relation to other lines, masses, colours in the scene. Sometimes there is the condition that a new item may mean the sacrifice of an old one which has been separately identified and has specific associations. Although a proposed new item may have all the characteristics necessary for fitting into the scene it may be rejected as a destroyer of beauty. A specific interest is a drastic modifier of this condition. Many a person who regrets the building of a house or a bungalow in a particular scene would have built himself a house there had he been able to build and use it.

This conservatism arises also from another and greater failure of imagination. Where the visual imagination does not fail, where a projected item of change in a scene can be visualised, and its probable æsthetic qualities appreciated, there will commonly be a failure to imagine the pleasurable human associations which might, almost certainly would, arise from the new work of man. Very few people really overcome this obstacle. Their associations with a particular scene have been in that scene with its general characteristics, with certain items specifically identified, with others partly identified, both sets in a general background. Only specific interests in the new project and its possible associations, often only the projection of the associations themselves, overcome this obstacle to change.

If a drawing or a photograph of an ordinary piece of English countryside as it is now, and a drawing of that piece of countryside as it might be, are presented to a group of people who know the scene the drawing of suggested change may be

<sup>1</sup> He frequently has also an acute sense of release from work and from occupational discipline.

rejected not for lack of æsthetic qualities but for breach of familiarity,<sup>1</sup> lack of associations, and absence of power with lay persons to project the possible associations in the subject. The way in which electric supply pylons have "settled into the countryside" or rather into our visions, thoughts and expectations of it, in many districts is very remarkable. At least some people who strenuously objected to this innovation would now object to removal of the pylons as detracting from the interest and even from the beauty of their countrysides. A person with a trained objective view and judgments of line, mass, colour and their associations may make a free judgment on proposed innovations. With lay persons it is usually only one unfamiliar with the actual scene who is able to give a fair judgment of the qualities of a projected scene, comparing it with that portrayed as now existing.

A strong specific interest is usually necessary to free, to say nothing of pleasurable, acceptance of a proposed change in a known scene or type of scenery. Agriculturists have many specific interests in changes in scenes or in scenery but they sometimes sacrifice these interests to previous appreciations and associations.

In considering the features of the English countryside it is not only necessary to remember that man made most of them; but that where man made beauty he can remake it and create equal or even more beauty; that what is destroyed by change is often not physical beauty but mental associations; and that where beauty is remade and increased a new set of pleasurable associations will in due course be created, and in the sum total man's enjoyment will be increased. The trouble is that the persons whose associations are broken by change are often not those who will build the new set. In scenic change in the countryside we have to be willing to create for posterity. Man's relations with scenery are of all kinds. Some are occupational, some of leisure or vacational, some of day-to-day associations of non-occupational or only of incidental occupational character. Obviously, the holiday-maker who may choose some of his relations with scenery and natural elements, and tries more or less to choose all of them, will establish quite a different set from those enjoyed and suffered by a farm worker whose choice is frequently very limited and often non-existent. But the holiday-maker caught in a storm not of his choosing will commonly enjoy or suffer more acutely, both physically and mentally, than the farm worker who is inured to all sorts of weather and whose

<sup>1</sup> Also, sometimes, on rational considerations of relative utilities or conveniences of known and proposed layouts which have no direct connection with æsthetic considerations.

sensitivities have been dulled by frequent experiences and the automatic resistances which they have created. Similarly the holiday-maker or tourist viewing a scene for the first time may be transported: the countryman who has seen it every day for twenty years may be negligent—until it is temporarily changed by some effect of light and colour, an occasion of a rainbow in one section, another of a thundercloud making contrasts, or another of spring-time when cloud shadows chase each other over the land and momentarily cause dramatic changes in an otherwise familiar scene.

Some of the relations between man and scenery are unimportant in the consideration of scenic change. Others are extremely important. Satisfactions of past associations may be of the most varied human character, and apart from the general pleasure derived from familiarity and the stability of a scene it seems probable that there are no universal elements of which all men are conscious. There is certainly no definition of beauty which will fit all the landscapes which give pleasure to one human being and another. We employ nearly all our mental qualities, all our mental and many of our moral vices and virtues, in our relations with and appreciations of landscape or natural scenery.

An old-established and known cottage behind a hedge at a bend of the road is a welcome element in the scene, a pleasure to behold. Another exactly the same newly set at a similar bend, giving similar effects of line and colour, would be a cause of irritation and annoyance because of restriction of vision and recognised curtailment of our liberty. These conditions may provide rational and valid bases for objection to such a new element in the scene. Then, apparently, we judge between convenience and beauty, but we stress the æsthetic rather than the more mundane loss.

Members of the general public are most moved by what are supposed to be æsthetic considerations when they protest against more widespread changes which do not affect their use of metalled roads. A farmer who has land inefficiently drained or in small or ill-shaped enclosures, or with hedgerows full of trees, wishes to uproot trees or hedges, make large enclosure or possibly sections without fences. Activities to secure these ends cause public outcry. The traditional pattern is being removed, a larger and simpler one is being substituted, or the change is so large in relation to the elevation that no pattern seems to be left. Here two or three mental factors are involved. The first, often unconscious until it is brought to consciousness by specific reference, is the extension of vision, the need of a new focus in the particular scene; then the reduction of intimacy and privacy

in the scene; and, third, a general conservatism and resistance to change—"this machinery ruins the land", "the land was better as it was". Considerations of utility and convenience may get mixed with these as when an old footpath has run alongside a hedge but must now cross a field which may be cultivated and cropped, and when the new conditions of the path reduce privacy and shelter by exposing the walker on all sides.

A nobleman and his family who enjoy the use of a large mansion and its widespread appurtenances set near one of the most alluring bends of an attractive river are exasperated by a new bungalow which breaks the line of the low hills which wall in the valley three miles away. A trampler on those hills breaks into profanity when he finds that bungalow and its garden preventing him taking a previous stance for another survey of the valley. The nobleman's family have no complaint, both they and the bungalow builder have appropriated to their particular residential uses attractive parts of the natural scene. As between use by the resident in the bungalow, who presumably enjoys the scene most of the year round, and the trampers who only appear occasionally, it might be difficult to measure which yields the greater sum of human enjoyment of the particular site.<sup>1</sup>

If in fact a bungalow or other new building disfigures the hillside, apart from the mere breach of familiarity, there may be valid social objection to it. In the absence of positive disfigurement the rational basis of judgment appears to be that of using the site in the way which will yield the greatest sum of human enjoyment. Measurement may be difficult, but the bungalow use is by no means automatically ruled out.

A number of straggling houses extending the original built-up area of a village, built in the eighteenth or early nineteenth century, is accepted, and if not with much positive pleasure certainly without displeasure. A similar building development of the present day raises the ire of many persons, especially motorists. Again there is the breach with familiarity; there may or may not be actual disfigurement (apart from the former breach); but there is again a sense of restriction, a curtailment of our own freedom, arising from the change. We would stop such changes if we could, but a consideration of morals might rule out any such action as based on selfish motives. The estimate

<sup>1</sup> There are at least some cases of irritation arising from new bungalows or small houses in particular settings where a residence built at ten times the cost to an architect's plans would be accepted. Here class interests, and sometimes ideas of comfort or pleasure appropriate to different classes, lie behind the objections which are not of pure æsthetic or even of genuine social character. It is necessary always to keep in mind differences in means in obtaining satisfactions, with those in relative valuations of utility and beauty.



of advantages and disadvantages to the cottage builders or users, the village, road users and casual visitants, is a complex one. It may largely turn on the means of the cottage users and the village.

A definite ribbon of building outside a town or a large village offends travellers not only because the architecture or the building materials are inappropriate, but because it changes the conditions of their movement. The walker, walking for relief from restricted vision, or release from human associations, has to walk farther to gain his desired satisfactions. The motorist has to pay more attention to the road, drive with more caution. The freedom of the walker and the motorist is restricted, but presumably the freedom or other satisfactions of the users of the ribbon of houses have been increased. A suburban house-owner motorist seeing the ribbon says, "Those people got houses without paying for making the street", and envy is added to a sense of curtailment of freedom.

There may be several good reasons for the curtailment of ribbon building, but parts of our attitudes towards it seem to arise from a fairly general desire to restrict other people's liberty in order to preserve our own. And rationality is not always an important element in such desires. The ribbon builders may be, often are, taking undue advantage of the community to which they are attached and the provisions it makes for its own satisfactions. There are many cases in which it would be better if a new residential site, off the main road, were developed and the otherwise "ribbon" houses placed thereon. But again the question of means is involved and the poverty of the ribbon builders may be as important as their selfishness. And in relation to both the "ribbon" and the isolated bungalow intruding on the scenery it must be said that the society which fails to provide for the people who do not wish to live in close communities is laying up trouble for itself.

There is no human or social benefit in any unnecessary restriction in use or treatment of land. Fulfilment of human needs, the full development of human personalities in social life and in relation to natural resources, requires that some individuals and communities should be able to make full, continuous, and intimate use of certain sites in which other people may have vague general interests. It may now be necessary to ensure that the vague general interest does not override the specific and intimate one, or that smaller specific interests do not prevail over the larger.

What are the rational bases of judgments of scenic change in relation to the countryside and in particular to country planning? Some of the bases are æsthetic, but there is little in

æsthetic judgments of views containing elements of nature and of human production which is truly rational. As previously indicated, many such judgments will start from familiarity and past associations. We may suggest the rule that new buildings should fit in line, mass and colour, the other elements in their particular setting. But in colour, contrast is sometimes (or to some people) as pleasurable as harmony. There is no hard-and-fast rule of taste and if both liberty and æsthetic enjoyment are not to be unnecessarily diminished considerable latitudes have to be allowed. It is particularly necessary not to confuse a breach of familiarity with positive disfigurement, and also to remember that nature, or nature with man the gardener (and unconscious landscapist), has often modified and will modify the ravages of man the builder.

This is of great importance in relation to a current tendency to represent further expansion of housing on the sparse settlement system as anti-social, to suggest increase in housing on the mass flat system, and to suggest the social desirability of the "clear cut" between town and country. Here class means, class standards, needs of one type of family and another, conditions of earning a living, of living, and of working and periods of freedom from work are all involved. The bachelor with an income of £500 a year, able to spend his week-ends in the country, may wish the "clear cut"; the town that is wholly town, and the country which is pure country. The man with a grown family with an income of £1,000 a year upwards, able to take part of his family from town at week-ends, may desire the same conditions.<sup>1</sup> The man with £300 a year or less, who wishes his children to have contact with some natural things, even on a small scale, who wishes to combine contact with natural things and some sense of privacy, may wish for the small house and garden in the suburb or the outlier of the town in which he works. If he or his family have a need of contact with growing plants, or of other views than those the town provides, a holiday once a year in the country may be quite insufficient. He may well desire for himself or family the more continuous contact, however limited it may be. Here continuous use, especially by a large number of persons, is far more socially desirable than preservation of a scene for a favoured few.

There are other possible conflicts in the distribution of land to different uses, and in particular between agriculture and residential development. The demand for reservation of land for agriculture may take three forms; demand of agriculturists

<sup>1</sup> The person with house or flat in town and "cottage" in the country somewhat naturally desires the "clear cut".

for continuation of opportunities of obtaining paid employment or earning profits; demand for reservation for food production in the national interest; and demand for reservation from the combination of these with the preservation of the agricultural landscape for æsthetic and general social reasons. As regards the first form, it is only necessary to say that the majority social interest is in residential use. The number of agricultural families per 1,000 acres may vary between 30 (or even less) and 200, according to the type of agricultural production, but the average for the country will be under 40. The number of families enjoying use under residential development may be 4,000 to 12,000. As regards the national interest in food supplies, it is not often remembered that a great deal of agricultural production is of æsthetic and social rather than nutritive values. This applies even to a number of "food" crops; but, as one illustration, the nation that can afford to use each year 600,000 to 700,000 acres for the production of beverage alcohol can scarcely deny opportunities to town workers who desire ornamental gardens, or croquet or tennis lawns. While farmers use some of the best land of the country to grow daffodils and tulips and their bulbs in Lincolnshire, or daffodils and anemones in Cornwall, the nation can scarcely refuse town workers opportunities of growing roses. If, however, the "beautiful gardens of Letchworth are so prolific that the town grows more food than the whole site did when devoted entirely to agriculture",<sup>1</sup> there need not be any conflict between residential development in garden cities and the safety of the nation's food supply. Indeed, if this is true, the real wastage of land for food production occurs in the close form of town settlement where normally parks and gardens are entirely for exercise and æsthetic enjoyment.

Where tastes are concerned, society and particularly the upper and professional classes have only themselves to blame if the lower middle and working classes have neither the means nor the tastes to select and demand appropriate forms, lines, textures and colours. If there is general failure in taste, then clearly the social and æsthetic leaders of society have failed in their duties of providing education and examples. When the nation cannot afford the type of buildings which would give satisfaction to its æsthetic leaders, it must do the best it can with the means available.

Other bases of judgments of scenic change will be economic, and still others will be social in character, and in the case of more general interests there will be tendencies towards substituting appeals to sentiments for more rational bases of judgment.

<sup>1</sup> G. and E. G. McAllister, *Town and Country Planning*, p. 137.

There is need of the closest possible consideration of the principles of distribution of land surface for purposes of obtaining material utilities and æsthetic enjoyment, and of means not only of controlling certain uses but of promoting combinations of satisfactions. Appeals to general sentiments are dangerous to the interests of individuals and groups and not uncommonly to those of the nation at large. Close measurements of advantages and disadvantages in various modes of use of land appear to be very rare. They may be difficult to make, but the difficulty itself is evidence of the danger of judgments made without the aid of measurements. It may be that the greatest need is that of devoting a greater share of the national income to the housing of the mass of the people in the different types of dwellings and surroundings which they desire.

## APPENDIX

### ENCLOSURE AND THE ENGLISH LANDSCAPE, ABERYSTWYTH

REFERENCE to the records or areas of land enclosed will show that only a minor part of the land of England was dealt with in the eighteenth-century enclosures. Thus Curtler (*Enclosure and Redistribution of our Land*, pp. 148-9) says: "It is very difficult for the twentieth-century Englishman to understand that nearly half the cultivated area of the country was still in open field and hedgeless in the middle of the eighteenth century, and that in 1794 some counties were still almost entirely under that mode of culture."

A parish in the Vale of the Red Horse, in "leafy Warwickshire", provides an illustration of the process, and of the people who did the enclosing. Parts of this parish which covers 4,800 acres were enclosed between 1480 and 1540 and other parts at later dates. In 1797 the remainder, some 2,638 acres, was enclosed. The Enclosure Commissioners set out and allotted all the common fields, and common or commonable meadow and pasture "having due regard to the quality as well as the quantity of land to be allotted, and of the situation and convenience thereof to the homesteads and messuages of the several proprietors." They made allotments varying from a quarter of an acre to nearly a thousand acres (to the Lord of the Manor) to more than forty proprietors. Over thirty persons were actually responsible for the fencing, and the smaller owners for more than their proportionate share. This is amongst the most attractive pastoral scenery of the Midlands.

# WALES : RECONSTRUCTION

by

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WALES is a country with approximately two and a half million people, but more than half of them live to-day in two of the thirteen counties : Glamorganshire and Monmouthshire. This concentration of population is due to the rapid development of industry on the South Wales coalfield during the nineteenth century and to the rise of great exporting centres like Cardiff, Barry and Swansea. It should be added that following the war of 1914-18 the export trade in coal and tinplates suffered severely and the industrial life of South Wales fell into decay and there was severe unemployment resulting in the region being officially described as " a depressed area ", or otherwise " a special area ".

A feature of the rapid growth of population in South Wales was the contemporary denudation of the better elements of the population from the rural counties. This, together with general depression in British agriculture, impoverished the Welsh countryside and caused a further migration from the land to the great cities of England and especially to London.

It is clear, therefore, that the salient problem facing the post-war planning of the Welsh area is an attempt to restore the balance between an area that is grossly over-populated according to present requirements of labour and a far more extensive area that should carry a larger share of the total population. How is this readjustment to be achieved? Let us examine first of all the possibilities that exist for the maintenance of some, at least, of the present population on the coalfields.

In 1931 it was estimated that approximately 188,000 persons were employed in coal-mining in Wales, and of these all, except some 15,000 are employed on the South Wales coalfield. It should be remembered that in addition some 60,000 are employed in the metallurgical industries in South Wales, but this figure serves only to show the outstanding importance of coal-mining on the coalfield. These figures serve also to show how small and comparatively unimportant is the North Wales coalfield and since its future is unquestionably linked up with that of the whole of the North-Western industrial area of Britain, centring on Liverpool and Manchester, it will be convenient to omit it from further consideration. The problem, therefore, resolves itself in the

first place into—what future employment can be found for these 175,000 miners in South Wales?

It is natural to consider at the outset the probable future of the coal-mining industry itself. This will depend very largely on the international coal market after the war. It is quite clear, however, that South Wales will never get the "lion" share of the British coal export it had before 1914, and it seems hardly likely that more than two-tenths of the available labour will be required in this field.

The fact that the coal-mining valleys of South Wales were developed exclusively for the export of coal is responsible for the very severe unemployment. No alternative industries are available. This raises the question of the provision of new "light" industries on the coalfield.

Difficulties arise straight away—available building sites are few. The valleys are deep and steep-sided with extremely narrow bottoms hardly able to contain road, river and railway. It is only along the northern outcrop of the coalfield as at Merthyr, Pontypool and Aberdare that such sites would be available and, one presumes also, in the coastal towns as well. At very best this will mean a great deal of travelling on the part of the workers. An optimistic estimate of the total employable labour that can be absorbed by the establishment of "light" industries would be just one-tenth of that available.

There remains the question of what agricultural development is possible on the coalfield. The background is again by no means promising. The deep, steep-sided valleys, the cold boulder-clay soil and the tough wiry grasses of the Pennant moorland, the high elevations and the heavy rainfall do not help. Poultry farming, with a little sheep-keeping linked with extensive afforestation schemes, seem the only real possibilities and it should be made clear that a very thorough development in this direction will hardly absorb a twentieth of the present labour supply.

The net result of this brief examination shows that, assuming the continuance of the present industries and the introduction of new "light" industries and the extensive utilisation of the barren hillsides for afforestation and small-scale farming operations, only some three-and-a-half-tenths of the present employable mining population can remain on the South Wales coalfield.

Before considering what can be done for the remaining six-and-a-half-tenths (involving some 114,000 former miners) it is necessary to consider another important aspect of the situation.

Wales is a cultural unit as well as a political unit. Over 900,000 people spoke the Welsh language in 1931 and the language is the medium through which the cultural life of the

people is maintained. No solution, however sound on economic lines, however desirable from the point of view of the planner, will succeed if this cultural factor is neglected or misunderstood. In the early Middle Ages the life of Wales was centred in her pastoralism and her society was tribal in its organisation. Blood relationships counted for everything, a man's position in society depended solely on his blood relationship with other members. Following the Act of Union with England in 1536 the Welsh system of tribal relationships was officially done away with, but there can be no doubt that the family has remained the unit of society in Welsh life in a manner unknown in the English countryside or in the English town. The Welshman loves his home and his family circle. He loves his "neighbourhood" too, and he is very reluctant to leave it, however many "faults" it may have. He feels he knows everybody in his little community and they are seemingly all members of his "extended" family. He knows the most intimate details of his neighbour's life and the extent of his worldly possessions. Strangers and newcomers are regarded with reserve and suspicion until all the detail of their personal life is slowly unfolded—that is, until they are gradually received into the "family". This cultural peculiarity is likely to have an important bearing on problems of reconstruction in Wales, for it will be extremely difficult to persuade families to move to new areas even with the prospect of economic gain.

The position of the 114,000 former coal-miners and their families merits further study in this respect. In the early days of the Industrial Revolution South Wales drew its population largely from the neighbouring Welsh counties of Carmarthen, Brecon, Pembroke and Cardigan. Later on, people came from farther afield. A strong English and even Scotch and Irish element ultimately helped to swell the numbers. In the very early days the labour on the coalfield was largely transhumant; the labourers returning to their farms at harvest time or even for the spring and summer seasons. This meant that their cultural associations with their rural background were closely maintained, and it is only in the last two generations that a break has occurred. We have to wait until the present century for the development of any form of industrial psychology on the South Wales coalfield.

The miners carried with them to the coal valleys their strong family traditions and even their endearment to their neighbourhood. It is curious that many of them clung to their poor, sunless, depressed valley even when hope of further employment in the mines had long since vanished. Will they be inclined to take advantage of any return to the countryside?—or have they

managed to retain in their industrial life the love of home and neighbourhood and lost the love of the country and the farm-yard which their ancestors possessed? Most observers fear the latter and if this point of view is accepted a further difficulty faces the planner, namely that these ex-miners when moved from the coalfield are going to become poor village or semi-urban dwellers and not farmers. Another point arises here. It has been already mentioned that during the present century a real industrial outlook developed on the coalfield depended on the rise of the trade unions and the Labour Movement. The Welsh collier transferred his religious zeal into these new movements with the result that the South Wales area has been notorious in the eyes of employers for its "Labour disputes". There is still a fear of employing the South Wales miner on new jobs and this becomes all the more important when any attempt is made to transplant him and his family to the neighbourhood of the small market towns where conservative ways of life and an Anglican sub-urban outlook are directly at variance with the background of an ex-miner from Ynyshir. No scheme for a movement of population will have any chance of success that ignores these "cultural" differences and treats all individuals as mere units in plans for the future of Britain.

This exaggerated conception of the "family" and the "home" has held up in recent years emigration to the great cities of England and, especially, emigration overseas. Welsh boys and girls do not want to leave home if they possibly can help it. If they decide to make a livelihood in England, then they consider it as labouring in a "foreign" land with the view to retirement and a return to their native hearth. Such is the ideal of the Welsh milk vendor, preacher or draper in London or Birmingham. Therefore, any attempt to move population from the South Wales coalfield either to rural Wales or to new settlements centred around the market towns of North and Mid-Wales, or even a move to prosperous areas elsewhere in Britain, is not a problem of economics alone, or of fitting units into a national plan, but one requiring a sympathetic understanding of the long and complex cultural background of the people whose economic and social life has to be thought out anew in the light of a national plan in the post-war age.

We can now turn to consider what changes must be brought about in Welsh agriculture and in the economic life of the market towns before they are able to absorb any additional population from congested areas. Agriculture should be considered first of all. From the occupation lists of the 1931 Census can be shown that out of a total of approximately 900,000 persons over fourteen years of age employed in some industry or other



in Wales, as many as 90,000 people are employed in some form of agricultural work. It will be useful to describe the different types of farming found in various parts of the country and find out to what extent these differences are related to differences in relief, exposure, soils and climate. Taking the country as a whole, the soils are generally heavy and cold, while moisture, rather than sunshine and warmth, is the outstanding feature of the climate of Wales. It is clear that the general conditions of climate and soil make Welsh farming predominantly pastoral. About 55% of the total land area of the country is actually farmed in crops and improved grasses. About one-third of the total land area is classed as rough grazing, while the remaining 12% is waste or non-agricultural land. Much of the rough grazing is used for pasturing sheep, while only about 23% of the area classed above as under crops and grasses is under the plough in any year. Much of this is only temporary arable land, growing crops to improve the grass in later years, and so the percentage of the land permanently under the plough is very small indeed. Sheep and cattle are chiefly pastured, and most of the crops grown (of which oats, barley, turnips and potatoes are important) are used either to feed the livestock or for consumption in the home.

Lowland farms are found in the Vale of Glamorgan, in Gower, in the Towy valley and south Pembrokeshire, on the coastal lands of Cardigan Bay, in the Lleyn peninsula and Anglesey, on the North Wales coastal plain and in the vales of Conwy and Clwyd, as well as along the eastern border of Wales, and in the vales of Severn, Wye and Usk. These farms are large in size, and cover from about 100 to 150 acres each. Roughly three-quarters of the land is given over to pasture and hay, and there is little rough grazing. It was on these farms also that most arable land was found at the beginning of the nineteenth century, but during the hundred years that have followed this has been slowly giving place to hay and improved pastures, and, hence, to a greater stock-carrying capacity of the farm in the form of cattle for milk. This process has made exceptionally rapid strides since the war of 1914-18, because the motor lorry and the improved roads have made the collecting and transport of the milk from the countryside to the railway stations and factories much swifter and easier than before. It is with the development of the liquid milk trade and its organisation on co-operative lines that there lies one of the most important avenues of further progress and the absorption of extra labour both on the farms, with electrical milking installations, road transport and factory work. The whole question of the development of an efficient dairy industry for export based on these

lowland farms should be considered. Another tenth of our surplus population could be absorbed here. War-time conditions have shown that the arable land can be rapidly increased. This should be made permanent and crops such as sugar beet and flax (so much needed in the aircraft industry) should be grown. Market-gardening near the larger towns should also be developed.

The upland farm is far more widespread in Wales than the lowland type because the high land occupies such a large proportion of the country. Many of these farms are of extensive acreage, being larger in this respect than those of the lowlands. But a large part of their area is usually composed of rough grazing, a third of pastures and hay, and only the small remainder is arable. Sheep and not cattle are predominant on the upland farms, but there are often a few cows, pigs and poultry. The cold impervious soils, the high rainfall, the lack of sunshine and the late spring consequent on high altitude not only reduce the variety of roots and crops grown, but also make the natural grasses on the moorland lacking in food value for the animals. This, in turn, reduces the size of the flock of sheep which can be sustained, especially during the winter season. For this reason it has been usual from very remote times for the sheep flocks to be driven to the lowlands during the winter.

On the small arable patches oats and potatoes are the most important crops grown, and they are used almost exclusively for feeding the farm animals or the household. Except at harvest time there is little demand for outside labour, the farmer and his family work daily in the fields or in the outbuildings. On the larger farms one or two labourers are employed, but in the management of the farm, or in the house, there is but little distinction made between the farmer and the hired worker. This is a peasant type of farming. The farm servant addresses the farmer by his christian name and does not refer to him as "boss" or "sir", as will be found on the lowland farms, in other words the farm labourer is here a full member of the farmer's family. It will readily be appreciated from what has been said before that any attempt to place ex-miners on these farms will be unsuccessful unless they are already blood relations of the farmer and his family. The moorland farmer will be slow in taking in extra labour. The great problem of the Welsh moorland is to increase the number of holdings and maintain those already in being. The application of science to hill pastures may increase the number of holdings possible and so give room for placing more families on the land. Agricultural experts under the direction of Sir George Stapledon, formerly of the University College of Wales, Aberystwyth, have now taken up

the improvement of these hill-lands. Their aim is to improve the quality of the grassland on sheltered parts of southward-facing slopes so as to enable the farmer to winter a larger proportion of sheep, and possibly cattle, above an altitude of 600 feet, than it is possible to do on the present rough grazings. This is to be done by land improvement and by sowing certain types of grasses and clovers that have been specially bred or selected, so that they can take the maximum advantage of the climatic conditions and thereby give a longer growing season to the sward than is the case with the fast-growing hill grasses which quickly grow out of their most nutritious stage and so become of little value as food for sheep. Such a scheme, in turn, will add to the farming possibilities of the moorlands, particularly by allowing larger numbers of sheep, and possibly cattle, to winter on the uplands and thus increase the stock-carrying capacity of the farms. It is pointed out that with the coming of the motor lorry and the caterpillar tractor these high moorlands are no longer inaccessible because of the poor transport for the agricultural machinery, manures and seeds that will be required. Experiments that have been conducted already have proved highly successful and most agriculturists forecast an increased activity in upland farming, with the welcome return to the moorlands of some proportion, at least, of its lost population.

The market towns of present-day Wales were almost all the creation of the Normans, deliberately planted by aliens among the Welsh as part of a policy of subjugation. A little garrison town of Anglo-Norman soldiers and traders sheltered within its walls would grow up under the shadow of a great stone castle. In the subsequent centuries many of those which were well placed geographically became the market towns of their neighbourhood and received increased trading privileges from the Crown and new charters of incorporation and grew in size around their original nucleus. Most of the castles have fallen into ruins or have been deliberately destroyed in the course of time, but a few are still inhabited as in the case of Cardiff and Chirk, while many continue their old administrative functions in new ways, i.e. by being used as police headquarters, prisons or county offices. It is important to know that these castle-market towns in Wales are situated mainly on the lowlands, and although their present population in non-industrial areas may range between 3,000 and 10,000 people, they do help to account for the greater density of population, as well as its more nucleated character on the lowlands as compared with the moorlands.

At the present time, however, they are all living on their past, carrying out a large number of administrative functions

associated with urban, rural and county councils. Some of them have important scholastic and ecclesiastical establishments while others are railway junctions and bus centres. They suffer from the lack of any industry of their own and here, perhaps, more than elsewhere in Wales there is an opportunity for the establishment of trading estates and minor industries on the outskirts of these market towns. With the return to road communications in the twentieth century the transport problem is now less acute, although some of these towns like Carmarthen and Haverfordwest are already supplied with good railway communications. We may ask what industries could be established near these towns with any possibility of success and without disfiguring the charming old-world setting of so many of these little boroughs? There is the large-scale manufacture of paint and polish for domestic purposes. The whole of the furniture trade with plastics, pottery and glazed-ware manufacturer. A large boot and shoe factory would help tremendously and give labour to some two hundred persons. The mass production of clothing could be set up at several of our small towns with considerable profit while in those towns like Newtown, Carmarthen and Llanidloes an attempt could be made partly to revive and partly to expand the former woollen manufacture—the expansion to include the introduction of the rayon industry. All these things should be possible within the framework of a national plan and under Government support. Subject to the cultural problems already mentioned the establishment of the above industries appears to be linked up with the future of the market towns both in the rural and in the industrial area; Neath, Maesteg, Aberdare and Merthyr should share in this development alongside of Carmarthen, Brecon, Denbigh, Flint, Newtown and Welshpool. While the importance of the labour-absorbing qualities of these industries should not be over-estimated, employment (outside the coalfield) could be found for some additional three-tenths of the surplus population by their establishment in the places and manner described.

#### RURAL INDUSTRIES.

It has already been stated that outside the coalfields no other industry is as important as agriculture. The geographical distribution of the two industries which, judged by the number of persons normally engaged in them, come next in order of importance to agriculture in rural Wales, however, should be considered. These are the slate industry and the woollen industry. Slate mines and slate quarries, in 1931, employed 8,712 people in all. Although this figure is insignificant when compared with the number engaged in coal-mining in Wales in the same year, we

should not for that reason underestimate the importance of the Welsh slate industry. Wales produces the best slate in the world and is responsible for nearly 80% of the total output of the British Isles.

With few exceptions the slate mines are found in Caernarvonshire, Denbighshire and Merionethshire. Sometimes they are quarried in large open-faced quarries which rise tier upon tier on the mountain-side, as at Llanberis and Nantlle. Elsewhere the slate lies deeper and it has to be obtained from large underground mines as, for example, at Blaenau Ffestiniog.

Near the mines and quarries the slate blocks loosened from the rock have to be sawn, usually by machinery, into convenient shapes and sizes, then split by hand into the required thickness and finally trimmed. If the slate is highly cleaved then it is used to prepare roofing slate, if the cleavage is less intense then it is reserved for the preparation of slate slabs which, owing to their smooth surfaces and their resistance to the corrosive effects of acids, are in great demand for laboratory tables or acid-containing vats used in chemical works. Likewise, slate slabs are fireproof and are thus extensively used on electric switchboards. Further, they do not warp as timber does, they are in demand as tables for accurate scientific work as well as for billiard tables.

During the present century and more particularly after the war of 1914-18 the demand for slate has seriously declined. This is due largely to the widespread use of tiles for roofing and flooring purposes and of cheap paper in place of slates in schools, as well as to the great progress in the earthenware trade which has found substitutes for slate in scullery sinks and other conveniences. In proportion, therefore, to its size the depression in the slate industry is almost as severe as that in the coal-mining industry, but, naturally, much more is heard about the depression in the latter as the actual number of men unemployed is so very much greater. The transference of a large number of these employees to small holdings or some other form of agriculture in North-West Wales will have to be considered in any future plan.

#### THE WOOLLEN INDUSTRY.

The woollen industry in Wales at the present time employs rather more than a tenth of the number of persons engaged in slate-mining or quarrying. In the latter occupation no women are employed, but in the woollen industry over half the total number of employees are women. There are about 80 woollen factories in all, and in spite of a very scattered distribution it is significant that about two-thirds are located in the counties of Carmarthen, Cardigan and Pembroke. The greatest concen-

tration is in Carmarthenshire in the valley of the Teifi between Lampeter and Newcastle Emlyn.

The term "woollen industry" is a very comprehensive one and includes a number of separate processes such as spinning, carding, weaving and fulling. Not all the factories are engaged in each one of these processes; some do spinning and fulling only and give out the yarn to handloom weavers who work independently; others are merely fulling-mills. In all cases the factories are very small, usually run by a single family with one or two paid helpers. Most of the Welsh factories are dependent on water as their source of power and only in the larger ones at Holywell, Newtown and Carmarthen and in the Teifi valley is steam, oil or electrically-driven machinery used. Whatever the source of mechanical power, however, a good supply of water is constantly needed for washing and cleaning the wool and for the fulling process. Thus, the woollen factories are usually found on the banks of streams and near to plentiful supplies of running water.

In the middle and latter part of the nineteenth century there arose a great demand for Welsh flannel made from the short rough wool of the local sheep. The flannel was used for making shirts, much in demand by the Welsh collier for underground work. As the coal-mining industry expanded so did the demand for Welsh flannel shirts. Previously, South Wales specialised in heavy woollen cloths and undyed tweeds, while North and Central Wales were known for their flannel. Partly in response to the new demand, however, a number of handloom weavers (mainly from Mid- and North Wales) settled in the valleys of the Teifi and the Towy, and flannel weaving began in these parts. By the end of the century these valleys became the chief centres of the industry in South Wales. Large quantities of flannel were sold at weekly markets or at special fairs held perhaps twice a year at Carmarthen, Lampeter and other central towns. Finally, the coal industry declined; and moreover, the collier, too, lost his taste for Welsh flannel shirts and so the industry has suffered.

In factories which are still operating, the finer qualities of imported wools (which are now extensively used) are made into blankets, yarn, tweeds, scarves and other garments. Some improvements have been made in recent years both in dyeing and in the use of attractive colour schemes, but still more initiative and a greater variety of production is needed if the woollen industry is to prosper again. It is hardly likely that a great number of additional employees can be absorbed into this industry unless it is linked up with the mass production of clothing and accessories such as scarves, ties, pullovers, etc.

The woollen industry may be looked upon as a potential source of employment for female labour.

There are a very large number of other, but smaller, rural industries ; but it is hardly likely that their resuscitation will have any marked effect on post-war planning.

It can be seen from the above that it is at least theoretically possible to withdraw most of the surplus population now on the South Wales coalfield and accommodate it in new industries to be set up over the country. It should be stressed, however, that this is quite impossible without a national plan under Government control. There should be a Development Board for Wales and all these projects should be directed by one single body with the backing of a very large development grant from the Treasury. These schemes cannot be put into operation by the local authorities, the whole must be planned as one. Such a Development Board could undertake further improvements covering the country as a whole. These might include works such as roads and bridges and the electrification of the railways so as to increase movement from one part of the country to the other. This Board might undertake the reclamation of waste land and bog land ; it could clean up the countryside of refuse tips and advertising boards ; it could improve the sewerage of many areas ; it could improve the hotel accommodation in rural areas and at seaside resorts and so help forward the tourist industry. These things do not depend on the large-scale movement of population and, perhaps, should be considered under a special heading, but this should not mask the fact that they should fall under the centralised control of a Development Board and be integrated with the regrouping of population envisaged in this chapter.

# RURAL SCOTLAND AFTER THE WAR

by

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THIS essay is devoted to rural Scotland, that is to the countryside and to the small burghs which, in the past, have peopled the growing cities, or sent their children to England, and to found or to strengthen pioneer settlements overseas.

## I—THE LOWLANDS: GENERAL CONSIDERATIONS.

While geographical influences upon human activities can rarely be precisely measured the most important geographical fact about a country is the density of its population. A map based on the 1931 Census was published by the Ordnance Survey. Attention may now be directed to the present densities of rural population in Scotland; we may thus get a measure of the capacity of our country districts to support population under present conditions. We should then ask ourselves how far the present distribution is a healthy one for the nation as a whole, and if not, how the distribution might be improved.

The map gives the synopsis of the facts as they were eleven years ago, and we must bear in mind the movement of population, for, during the preceding decade, there had been a decline in all Scottish counties save six, viz.: Renfrew, Lanark, Stirling, Midlothian, Selkirk and Roxburgh. And in all of these six the growth was less than 4·7%, the average growth for Britain as a whole. This decline, continued until the outbreak of war, is in great contrast to the increase in southern and eastern England. And in spite of the birth rate remaining higher than in England, the fluctuations of population have been severe, giving a high "variability" and so interrupting the normal tenor of community life.<sup>2</sup>

The regions with which we are chiefly concerned are classed on the population map as having the following densities: "sparse", under 25 per square mile—mainly in glens of the Highlands; "thin rural" (25 to 50 p.s.m.); and "normal rural" (50 to 100 p.s.m.). These populations are almost entirely

<sup>1</sup> Reviewed by the authors from their paper in the *Edinburgh Journal of Science, Technology, etc.*, Vol. XV, Part I, 1940.

<sup>2</sup> Regional figures of variability would be well worth calculating for the British Isles, by the method worked out by A. Geddes in "Half a century of population trends in India: . . .", *Geogr. Journ.*, Vol. 98, 1941.



dependent upon agriculture and stock-keeping, either directly or indirectly, but they include the usual inhabitants of villages—tradesmen and the like. The areas described as “close rural” (100 to 400 p.s.m.), and “transitional” (400 to 1,600 p.s.m.), i.e. transitional to “urban”, are in general those where occupations other than farming are available, as for example, fishing on the Moray Firth coast, but there are a few small districts where the higher densities are due to market-gardening. Dr. Catherine Snodgrass has recently made a map of the density of Scottish population directly dependent on farming as referred to the area of farmland, and has used this as a basis for interesting comparisons with the densities in comparable regions of England, Denmark, Germany, Poland and Hungary.<sup>1</sup> In Scotland the people directly dependent on agriculture, i.e. agricultural workers and their families, number from one-third to one-half of the total in the regions we are considering. Thus, for example, in Wigtownshire the rural density is 50-100, while the agricultural density as above defined is 26-39. In Buchan and in the Berwickshire Merse, while the rural densities are the same (50-100), the agricultural density in both is 39-51. Again, in the Clyde Valley area shown as “transitional” (400-1,600) on the map, the general agricultural density is the same as in Wigtownshire (26-39), but in the fruit-growing belt near the river itself it rises to 64-77.

The regions of Scotland marked by the “thin” and “normal” rural population densities are the lowlands of the centre and north-east, of the south-east and the south-west: they are accessible and they include the best agricultural land: in many districts the agriculture practised is in quality unsurpassed in Europe. In regard to these regions, then, we are entitled to ask whether some of the “sparse rural” densities cannot be raised to “normal rural”, and “normal” to “close rural”. If it can be shown that this aim of increasing the population of the countryside is really desirable in the national interest, can we assume that the State will spare no effort to make possible any radical changes that are requisite for the purpose?

We are now confronted by three questions, viz.:

- (1) Can the drift of youth and of skilled workers from the countryside be stopped?
- (2) Can more people be effectively employed in agriculture?
- (3) Is it possible to induce the creation or readaptation in villages and country towns of manufacturing industries which would be successful?

In attempting to deal with these questions here we can do

<sup>1</sup> C. P. Snodgrass, “The density of agricultural population in Scotland; with English and European comparisons”, *Geogr. Journ.*, Vol. 97, 1941.  
C.S.N.P.

no more than offer suggestions, and for agriculture we cannot do better than refer to the policy of Sir John Orr, and cite a recent pamphlet by Dr. Allan Fraser. In "Growing Scotland's Food", he sets out two remedies for the plight of Scottish agriculture. In the one, his "Short Term Policy", he recognises the fundamental importance of oats in Scotland as requiring the plough, which keeps stock healthy and land clean, and hence recommends an effective subsidy on the growing of oats. His "Long Term Policy" is the establishment under national trust of a comprehensive small-holding policy, with the dual object of increasing the supply of protective foods available to the industrial worker—i.e. milk, eggs, fruit, and vegetables, and more meat too—partnership between State and small-holder should, Dr. Fraser thinks, be on the metayage system, the State providing land, stock, equipment, supervision, and arrangements for effective co-operation, the small-holder providing his labour and "an abundance of health foods". Many of Dr. Fraser's recommendations apply also to farming. The needs of rural re-housing and of rebuilding obsolete steadings will offer an opportunity of re-planning fields, farms and villages, which were last laid out according to a system of estates and farms now out of date; and the re-grouping, not only the division of units must be considered.

Let us now turn to the question of the future location of manufactures, bearing in mind the requisites—capital, labour, site, motive power, raw materials, transport facilities, access to markets. Some of these factors we must pass over with but brief remark as unsuited to generalisation in a paper of this kind, and the factors of capital and factory sites we omit altogether. Clearly, if an industry is likely to succeed, both will be forthcoming. The dispersion of war factories, whether by the creation of entirely new establishments or the adaptation of existing ones, is a fact to remember, even though their location must remain a secret for the time being. Dispersion must affect both the small, chiefly Lowland burghs and villages, where industries were moribund and skill was at a low ebb, and also the Highlands, where industries may have been entirely lacking. In the Lowlands there may well be possibilities for utilising this stimulus outside the "Clyde-Forth Conurbation", as far as the northern periphery of the Lowlands and the North-East and in the Southern Uplands, on or near direct routes.<sup>1</sup> A point in favour of such locations for industry is that as a rule their establishment and extension will not occupy the best agricultural

<sup>1</sup> The term "conurbation" is used in the original sense, as by its author Patrick Geddes in *Cities in Evolution*, 1915, pp. 43-49. The need of retaining and developing the conception of a "conurbation" as a regional unit with rural, as well as primarily urban functions is discussed elsewhere by Arthur Geddes.

land. But still more important than the establishment of new factories, stimulated by the war, may be the renewal of industries with a fine tradition among masters and "workers", like that of the Border tweed industries, which have been hard hit and sometimes all but ruined by the restrictions of the war.

#### REQUISITES FOR LOCATION.

##### *Labour.*

The labour supply for the earlier factory industries of Scotland was drawn largely from the country while craftsmen, urban and rural, furnished the élite from which modern technical workers developed. This has left curious survivals. For example, in the jute factories of Dundee the women weavers consider themselves and are considered as a class above the spinners, though wages and skill are little different. This is apparently because 150 years ago weavers were craftsmen but spinners were untrained cottar women from the country. If such conservatism is found in a city we need not be surprised to find that conservatism of habit and outlook may make it still harder to utilise available labour in new ways in the smaller burghs and semi-industrial villages. It is said by factory managers that in a large centre, notably in London with its scores of adjacent factories, young people, particularly young women, rapidly acquire handiness and their deft fingers are readily adaptable. In small centres, where there is neither opportunity for frequent readaptation nor a stimulus of healthy example among young people, a modern light industry finds the right labour with greater difficulty. What is required is not so much a specific skill, in the older trade unionist sense of the word, as an all-round adaptability of the intelligence and the fingers. This is not readily stimulated by village or small burgh life as it exists to-day, though Women's Rural Institutes have had an excellent influence. More might be done to develop handiness in school. Kindergarten games and plays show how simple techniques may be developed in the right spirit, of "work" that has a touch of "play"; and this method might be developed at higher stages. There is perhaps less of an antithesis than we have been accustomed to think between "arts and crafts" and nimble and adaptive work in a modern factory.

Of great potential importance are recent improvements of hand-control tools and appliances and small-scale machinery. These, which can be coupled with the use of light power, are a hopeful factor for small-scale industry. The very fact of increasing standardisation in production by a geared machinery tends to promote a certain reaction and to create a demand for

articles which shall be personal, unique, and "hand-made". The taste for hand-made tweeds is the most notable Scottish example of this demand. The initial expense of inventing, making and experimenting with machinery of any kind had diverted capital, ambition and invention from small workshops to great factories, and it is only from the latter that millions can be amassed. The invention of machinery for small workshops, begun early in the Industrial Revolution and then broken off, is, however, starting afresh. A notable case of the right spirit and method applied to spinning and weaving is embodied in the machinery and improved looms originally worked out by Dartington Weavers (Devon) and carried on at Stratford-on-Avon by Handwoven Fabric Textile Supplies Ltd.: The Highland Home Industries Ltd. co-operate with the Scottish Country Industries Development Trust and its successful work in modernising mechanical technique while reviving traditions, e.g. among country smiths.

#### *Power.*

For many reasons it is to be hoped that cheap electricity throughout Scotland will meet all requirements that are likely to arise, and that future manufactures will not have to depend upon the wasteful haulage of coal or of oil. Unfortunately as yet the promised boon of the electricity "grid" has not fully materialised. We know of a village factory which formerly contracted for current at  $\frac{1}{2}d.$  per unit and now has to pay twice that amount for electricity from the grid. Evidently there is room for improvement.

#### *Transport.*

The questions raised by this heading are manifold; but they are national economic questions calling for an early solution which will benefit rural Scotland as much as any part of the country; for it is quite certain that throughout Britain we do not as yet make the proper co-ordinated use of our four arteries for the movement of goods: our rails, our roads, our canals and our coastal waters. It is relevant to note that whereas railways tend to agglomerate industry and population, canals, roads and motor coasting vessels encourage wider distribution.

#### *Access to Markets.*

Each separate industry has of course to consider its own market, but the regions served may be usefully classified as Scotland, the British Isles, the World. A manufacturer in northern Scotland who competes successfully in world markets has said that to do so his goods must be just a little better than

those made in England; and there are indications that this applies throughout Scotland generally, and in small towns more than in the cities.

### *Raw Materials.*

If we are to aim in Scotland at greater production of food-stuffs and their conveyance to a profitable market we ought also to be ready to deal with surplus produce; for here there are two possibilities: first preserving, and secondly manufacturing locally with a view to marketing goods higher in value than those yielded by harvest, dairy and slaughter-house. The ordinary farm crops would not seem to lend themselves to any great developments in these directions. Nevertheless there might well be room for extended manufacture of oatmeal foodstuffs and for the making of starch and perhaps also industrial alcohol from potatoes: the residue from the latter process is said to have considerable value for stock-feeding. On the other hand there does not seem to be a prospect of much extension in Scotland of sugar-making from beet. But if we turn to crops at present little grown the prospect may well be much better.

It seems certain that the average Scottish dietary would be improved by the addition of more green vegetables; and the growing of these would occupy more people on the land. The possibility of exploiting the west coast climate for early crops will be referred to later. For the rest concentration would be upon crops large enough to meet the main demand within reach of economic transportation; and means of preserving surplus crops should be provided. In 1937 there were twenty-two canning factories in Scotland, and of these only one packed vegetables.<sup>1</sup> Yet canning is surely a desirable rural industry. Perhaps its seasonal character causes some reluctance to establish it; but this difficulty is met elsewhere, and the possibility of manufacturing bottled relishes suggests some combination with the dairying industry. The canning and preserving of fruit is already better established: in 1937 there were eight factories so engaged. At the same time there were seven meat-packing firms; the packing of preserved meats requires greater care and skill than is the case with vegetables, and also, we should suppose, more capital outlay. Yet seven meat packers appear to be a small number for the whole of Scotland, with its livestock production.

It will have been noted that the agricultural policy put forward stresses the growing of vegetables as part of a small-holding

<sup>1</sup> Cf. D. V. Howells, "Report on the Canning Industry in Scotland", in *Light Industries in Scotland, a Case for Development*, Scot. Econ. Committee, 1938.

scheme. But it may be pointed out that market-gardening, although involving more intensive cultivation and increased labour per acre, need not necessitate a smaller production unit, such as individual small-holding. Limited companies have been started in south-eastern England for fruit growing on a large scale. The relation of market-gardening to canning and jam manufacturing on a large scale has sometimes been one of indirect encouragement of the small-holder by utilisation of his products.

This leads us to the utilisation of animal products in general, and here we seem to be confronted by a difficulty raised by the Government policy of centralising the slaughter of animals. Doubtless there are many arguments in favour of this, but it must surely lead to large expenditure in animal transport and it would seem further to place an unnecessary obstacle in the way of industrial enterprise in small towns. Presumably, centralisation of slaughtering will ensure the more complete use of carcasses than has been possible in small places in the past. But is it not reasonable to hope that such an object can be attained on the smaller scale in the future and that such things as bones, hooves, horns, hair, gut and blood can yield their products within a reasonable distance of the farms that nourished them? Again, we have recently heard of a slaughter-house where sheep's tongues were regularly destroyed as unmarketable: this of course because a meat-packing establishment was lacking.

Scottish hides have an excellent reputation and so have Scottish tanners and the leather they make. Yet the leather industry suffers in various ways as compared with that of England owing to its small size and its geographical position. Moreover, the same applies to the boot and shoe industry which has steadily changed its character with the development of mass production.<sup>1</sup> Nevertheless, with some specialisation in goods of first quality neither the scale of the establishment nor the distance from markets need present insuperable barriers to success in this group of industries. Such manufactures would seem to offer reasonable means of retaining and extending in the small town trades in which traditional skill has not yet been eclipsed in Scotland.

Lastly, the fishing industry of the east coast, which has been so sorely hit since 1913, needs backing such as the fisheries of every other great competitor received since 1918-19. The fall in the industry has been disastrous, in numbers of men, in their employment, and in capital and return. Whereas in Norway, for example, there were, in 1913, 63,000 fishermen, in 1936 there

<sup>1</sup> Cf. A. G. Buchanan, "Report on the Boot and Shoe Industry in relation to the Leather Industry in Scotland", *idem.*, 1938.

were 120,000; but in Scotland numbers fell from 33,000 to 19,000, of whom many were ruined or unemployed. In one case numbers doubled, with prosperity, in the other they were virtually halved, with loss. Does the fault lie in the Scottish fishermen themselves? "I am inclined to think not," replies Mr. Neil Gunn, "and for this reason, that when fishing all over depended on the efforts of fishermen themselves . . . with neither large shore capital nor Government assistance at their backs, then our Scottish fishermen found little difficulty both in thriving at home and in commanding foreign markets." While the Scot has received no favour "all his competitors have . . . (1) by heavy capitalisation and concentration by shore syndicates in England of drifters and trawlers, and (2) by Government fostering and direct assistance abroad."<sup>1</sup> The loss to the quality, as well as to the numbers of the Scottish community would be irreparable, if preparation is not made now for prompt action when peace returns.

Thus it is our contention that, with sufficient national incentive and drive, very considerable rectifications might be obtained in the future distribution of population over the lower regions of good land in Scotland. To this end we would urge, first, the intensification of food production and, secondly, the judicious encouragement of selected manufactures in the smaller centres designed specially to make the fullest use of the raw materials provided by the land. We believe that such developments would react greatly to the advantage of the nation socially and economically; and we refuse to believe that the obstacles to the substantial growth of rural population are insuperable. In the Danish Islands where the standard of living compares well with that of eastern Scotland the density of the agricultural population is over seventy per square mile, which is greater than that in the fruit-growing belt of Clydesdale. On the best land of central Germany the agricultural density can be compared only with that found in the environs of our cities where market-gardening is highly developed.

We are dealing with rural Scotland, but since industrial districts in the "Midland Valley" are bound to affect greatly the life of the surrounding countryside it is pertinent to refer to conditions in central Belgium. Here there is a great coal-field with vast heavy industries associated; yet there are few large towns. The workers have their homes in large, almost continuous, semi-urban areas where they cultivate small plots of land, and they travel to their work by train. An essential factor therefore is the cheapness of railway rates: the Belgian

<sup>1</sup> Foreword by Neil Gunn to Peter F. Anson, *The Sea Fisheries of Scotland: Are They Doomed?* (55 pp.), 1939.

State Railways do not seek to pay dividends. We cannot here discuss the merits and defects of this Belgian system of occupation: obviously a complex subject. But the imitation of some of its elements cannot be neglected as a possibility in central Scotland. We may hope, however, that the countryside will not be altered without respect to features of its old charm: and in Rosyth we have one example of the renewal of Scottish cottage and domestic architecture. And here it is appropriate to refer to the Scottish "Saltire Society". For its prime aims include the co-ordination of geographical survey and economic planning with artistic and social renewal.

## II—HIGHLANDS AND ISLES.

The Highlands and Isles offer very different problems from these. There the cultivable land is strung out between mountain and moor, in patches in the floors of the glens or on lower slopes just above the floor, and dotted along the coasts of loch and ocean. Hence the guiding principle we stress is to determine how far the hills serve the glens or, better, to discover how far the uses of glen and hill do, and may best be made to, complement one another; for each glen or strath, with its hills, must be planned as a unit.

Over a century ago sheep-farming became a dominant industry and has remained so, apart from a vicious, because deleterious, specialisation of pasture for deer forest. Here the difficulty is of course to provide "wintering" sufficient to utilise to the full the summer asset of the higher hill pastures. It is to be hoped that the experiments of the Macaulay Institute and Farm in Aberdeen and Lewis and the work of Professor Stapledon in Wales may go far to meet this, first by peat reclaimed for hay or oats (cut green for ensilage), or by permanent grass and, second, by amelioration of lower hill pastures to form really good winter grazing for hardy sheep. The part of hardy cattle in improving pasture by hoof, dung and non-selective grazing is not to be forgotten. In so far as dairy products may form a surplus, especially for butter making, creameries are a possibility: the Irish agricultural example has much to teach us.

Apart from wool and other animal products the chief raw material for manufacturing industries in the Highlands must be wood, since minerals in paying quantity have not been found; and the areas which must ultimately be afforested are very large. Forestry based on the Scots pine, with the addition of larch and fir, is a mainstay in Atholl, Strathspey and the east. On the west coast species from rainy western Canada have found themselves at home, notably the Sitka spruce. Two colossal



risks have to be faced, it is true: the risks, even once in a lifetime, of a destructive fire or of a catastrophic gale. And not for a generation, say till the 1970's, will the output of timber planted since 1918 have begun in any quantity. Meantime war is laying bare the land of its mature woods. Where the Ministry of Supply clear the brushwood, incidentally easing the passage of tractors to carry away the wood, planting can be readily undertaken; but if this is not done at once, the consequences for the future are serious.

The claims, we will not say the quarrels, of sheep farmer and forester need to be carefully weighed. For although no forester asks for the best arable land (except perhaps a field for the forest nursery) he does ask for the best hill grazing on which the grazier had counted in winter when the poorer and higher grazing was useless. Shelter belts, on the other hand, assist the upland sheep farmer. Favourable estimates of the improved return per acre planted with trees are apt to ignore this aspect—the possible deterioration of the remainder of the sheep farm or glen. Among the best efforts to assess the ecological and economic claims of sheep farmer and forester were those of W. G. Smith.<sup>1</sup> Recent reports on the Highlands, by utilising separately the advice of experts upon farming or upon forestry and then proceeding simply to list their separate claims, fail to solve this real problem, that of balancing the economy of the glen as a whole, from floor to hill crest and from sea-shore to hill watershed.

The use of hydro-electric power, we feel, should be developed upon a regional basis. Instead of taking Highland hydro-electricity to compete in the Lowlands with power from coal, it can be used in the Highlands. The scenic aspect too is important, favouring small use rather than great; for our 1,000-metre bens are dwarfed by erections which would be hardly noticed in the Alps, and to spoil the foreground is to ruin the landscape. As semi-rural industries develop from timber or other materials, power should be located at route junctions or by piers, for ease of transport, but with due regard to habitability and social opportunities. At such places we should hope to see erected sawmills, works for pulp or plywood manufacture, and perhaps other wood industries, such as wood distillation. And if good hardwoods can be grown there might be partial working, e.g. of bobbins. Even simple types of furniture might be manufactured with attention to the development if possible of Highland design. The value of birch may rise. But the fact must be faced that—under recent conditions of rural decay—the Highlands owed their reafforestation by the State primarily to the need for a reserve of pit props in case of

<sup>1</sup> W. G. Smith, *Scottish Journ. Agric.*, 1919-25.

war. It follows that the need for a timber reserve as a means of defence against blockade—at least during a period of possible national danger, let alone in a time of threatening war—must militate against the felling of coniferous timber in a steady annual flow, such as alone could supply the raw materials for an important rural industry. It is all the more necessary to plan the conditions of life in each glen as a whole.

Improved kailyards for home consumption are a real asset to the modern Highland home, and this suggests further developments. There seems little doubt that the more sheltered western coasts, with their mild winters and early springs, encourage the growing of vegetables and flowers for the early city market, followed by provision for local sale for summer visitors later in the season, when lowered prices in the cities no longer pay for transport. Especially in the east, with its dominant heather, bee-keeping could be greatly fostered, as the profits of pioneers have shown on the Braes of Moray. The Scottish Agricultural Organisation Society is making headway here but needs still fuller support. In the exposed Outer Hebrides, on the other hand, the severity of the winds had seemed an unmitigated drawback until some three years ago. It was then realised that wind is the worst enemy of potato disease, that is of the aphids (or green fly), which carry the virus disease. Scottish seed stock potatoes, from Moray and elsewhere, already have a good reputation as relatively free of virus. Could absolutely disease-free stock, such as are bred at great expense in the Cambridge Plant Virus Research Station, be multiplied in the Hebrides, potato growers would be saved an enormous annual percentage loss. In war-time we may lose as much from disease through lack of healthy stock as we shall gain in increased area. It is essential to breed good stock, and it now seems that even in Lewis “it’s an ill wind that blows nobody good”—for the clean Atlantic winds minimise potato virus and make the islands the ideal spot for multiplication of disease-free potato stock.

Among the most productive and promising of recent developments has been the egg industry of the Orkneys, a notable feature of a sanely balanced small farming, rather than crofting community. It may be that co-operation can go far to overcome the inherent difficulties of the individualistic farming which superseded the decaying system of conjoint labour, freeing the way for individuals to advance after 1750, but which broke up the older social structure rather than renewing or replacing it. Scottish farmers have, as Britain goes, an honourable record in co-operation, but that of the people of the Orkneys is perhaps the highest of all.

The costs of transport must be minimised by co-operative

purchase and sale and by two-way loads. The motor lorry helps inland. On the coasts the modern counterpart of Para Handy's S.S. *Vital Spark*, of Neil Munro's Clydeside tales, is likely to be the motor coasting vessel. Distance, however, remains; hence in production a better balance of home use and marketable surplus must be sought, with the home—one's own and one's neighbour's too—taking the first place.

The development of the tourist industry is indispensable. The Youth Hostels are bringing up a new generation who, later in life, will demand really moderately priced hotels and boarding houses. "Holidays with pay" and the necessity for "spreading" these will lengthen the tourist season, even into winter for climbing. Thus, with a greater and more prolonged demand, new popular hotels can be developed. The present tradition of hotel keeping, in which the licence plays a large part in the business, is inadequate, and it may be necessary to create a new interest. Improved housing in the Highlands aids summer letting, or helps the housewife to add to the family income with "bed and breakfast", often with happy human contacts, brief or lasting. Simply furnished hotels, constructed perhaps of local timber and different in appearance from their heavy Victorian predecessors, should attract by their frank simplicity. Even though the season be extended, as is likely, the winter is bound to be a slack period for which an occupation must be devised. The services of gillies or guides are not infrequently recruited from students on vacation. Heavy expenditure on sport, by sporting landlords or shooting tenants—which is sometimes lavish, usually of uncertain duration, often positively harmful and rarely of permanent benefit—is likely to diminish. A more widespread tourist industry offers a sane alternative. Need we fear that the Highlands will be spoilt? Not, we think, if the best is made both of our traditions and of the present outlook of Scottish youth. A word as to the national, even the spiritual aspect should be said. The very fact that the upper classes have opportunities for wider culture has tended to anglicise them. Hence there is often more genuine feeling among the workers than the wealthy classes for the essential channel of Highland tradition, namely Highland song. At the present day, as in the past, many of our best Gaelic musicians are hotel keepers. A democratised tourist industry can and should develop that tradition at its best.

Turning to the sea, it must be owned that the fisheries of the Western Highlands and Isles had never really caught up with the main fishing bases of Britain, those on the East Coast. Hence the decline in the herring industry, especially, hit them hardest after the last war. There are no doubt possibilities in line

fishing; and shell fish fetch high prices. Could co-operation for storage (in tanks), for transport and marketing be arranged, the commercial difficulties of distance and isolation might be overcome. Yet out at sea the work is lonely for the men, and so is the home life for the women in the scattered coves and "creeks" of the west; while schooling and experiences of urban life have undermined the old habits of mind and spirit that helped the people to live an astonishingly rich life in their tiny communities. It seems logical to think that just as hunting and primitive pastoralism had in turn to give way to farming of increasingly intensive character, so part at least of the "harvest of the sea" will best be reaped by those who shall sow, breed and fatten their fish in artificially manured nurseries or fattening ponds.<sup>1</sup> Promising experiments with white fish and oysters are in progress in the West Coast.

Factories in the Highlands have hitherto been of two types: (1) those based originally on local materials and skills, like the distilleries of fine malt whisky and the woollen mills—or "inter-war" developments, the most remarkable being that of the so-called "Harris Tweed" industry of Stornoway; and (2) more exceptionally, those erected because of hydro-electric power, notably the aluminium works of Kinlochleven and Fort William. In our opinion, essentials to economic and social success are the combination of local tradition with a reputation associated with a "sentiment value", one which should be lived up to. Handicrafts encouraged by the Highland Home Industries, a non-commercial, i.e. "sentimental" limited company, have set an example to Highland and Lowland factory spinners, weavers and dyers, and to manufacture in the whole English-speaking world. The example given is out of all proportion to the small numbers, working hours and resources of the women and men engaged. Was ever "sentiment" better justified?

The Highlands and Isles demand and receive special notice, in spite of the numerical unimportance of their population, by virtue of the intense human interest of their people and the meaning of their traditions to the rest of the Scottish people, in whom Highland blood is strong. Over-idealisation is as little use as over-criticism, and there is too much of both. Only their own understanding of themselves, together with a measure of understanding in the south, can be of real service. In this brief postscript we can only touch upon the kernel of traditional Highland social life, though this is significant to Lowlanders too, for their own rural life at a somewhat earlier period was built on a similar model.

<sup>1</sup> Fabius Gross, "Food Production by Fish and Oyster Farming," *Nature*, Vol. 148, 1941, p. 71.

The diversity of landscape and of local history since the '45, it is true, has led to the greatest diversity of conditions. The difference between the crofting communities of the north-west and the small farmers of Argyll to-day is, socially at least, as great as between the latter and the Lowlanders. In spite of this diversity one important generalisation may help us to understand the roots of social life in the Highlands. We should remember that, whatever the feudal superstructure, the most characteristic unit of Highland farming was small, a unit far smaller than "the clan". It was the farm team, as one may call it, typically of four families. Each family had its pony, the four animals combining to draw the plough on the land re-divided by runrig. Peat cutting, delving, house building, harvesting, herding, and sailing a boat, or (indoors) spinning and waulking the cloth—almost every occupation in fact, was planned as team work. That team or unit was very small, like the patches of cultivable land it worked amid the moors, but it was very coherent.

Even to-day, immediate neighbourly aid at work is widespread and real, and with that the co-operative spirit is strong. Outside a usually narrow circle, co-operation, though by no means impossible, is undoubtedly harder to achieve. Recognition of this characteristic will go far to prevent errors and to make the best of the Gaels' own limited but special aptitude for co-operation.<sup>1</sup>

### CONCLUSION

#### MANUFACTURES AND AGRICULTURE, SKILL AND YOUTH.

We have now indicated ways and means, almost unused for the past hundred years, for reviving local industries, and have also pointed out new lines on which the problem may be tackled. Much will depend both upon the co-ordination (partly by voluntary effort) by Scotsmen themselves of spontaneous local and regional projects and also upon the administration of a reasonable share of Exchequer funds. For regional government properly implies a real measure of autonomy, and not merely a new machinery for provincialising certain aspects of British administration. But government itself, whether regional or national, can only act successfully in harmony both with business enterprise and social initiative. The same principle holds true for agriculture. Co-ordination of local, regional and wider efforts is needed to ensure an essential supply of "protective" foods and of raw materials as well, and this must be backed by intelligent urban demand and support.

<sup>1</sup> Cf. Arthur Geddes, "Lewis and Harris: The Island and its Future". (*In the press.*)

To achieve the high level of skill vital for success in local industries in Scotland it is necessary in the first place to conserve existing standards by maintaining and developing rural manufactures and by recognising the craftsman's personal pride in his work. Further, means should be sought to raise the existing level of skill and encourage the faculty of enterprise. It is the drawback of "landward" places that their people tend to fall into industrial grooves—or rural ruts—and we should like to see in more and more of the workers something of the pioneer. Now if the spirit of the pioneer is once felt and captured in youth it will take root in character and will find its opportunity when maturity and its responsibilities arrive. This is the great lesson to Scotland of the Youth Colleges and Schools of Scandinavia and Northern Europe, the "People's" and "Folk High Schools" of both town and country. There, if only for a few months, young men and women find opportunities for companionship and for learning and free questioning not to be found in factory and field, with emotional outlet too of art and song. No factor has been more significant in the rise of agriculture and co-operative industry in Denmark, for instance, than the pioneering and experimental habit of mind of its organising workers. This capacity for pioneering and faculty for experiment, retained and developed to a mature age, are gifts they acknowledge to their Colleges of Youth.

# A MEMORANDUM SUGGESTING HOW A RURAL COUNTY COULD CONTRIBUTE TO THE NATIONAL PLAN FOR RECONSTRUCTION

by

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THE County of Dorset may be taken as a typical area of rural England. It has no large-scale industrial development, but depends on agriculture as the basic occupation of its population. The Industrial Revolution, however, with its concentration of the vast majority of the population in huge urban areas, has indirectly affected the rural economy in two ways. In the first place, by neglecting the industry of agriculture it has dried up the source of wealth which maintained the buildings, the fences and the woodlands; and in the second place, it has tended to use rural England as a pleasure garden. The result has been in most parts of the country that villages have decayed and farming has given place to catering.

The first object of a rural reconstruction plan, granted a national policy for the long-term revival of agriculture, must be:

- (a) To restore the farmhouses and cottages structurally, either by reconditioning where possible, or by new construction carried out in a manner in sympathy with the ancient pattern.
- (b) By a complete renovation where necessary of all farm buildings.
- (c) By a complete water supply to all farms, villages and essential fields.
- (d) By village drainage schemes where this is found to be necessary.
- (e) By reconditioning the water-meadows and their drainage systems.
- (f) By reconditioning the drains of all bad fields and, where necessary, carrying large-scale improvement schemes.
- (g) By reconditioning all fences and gates where necessary.
- (h) By renovating woodlands and replanting where felled.
- (i) By reclamation of land which has gone back to scrub.
- (j) By control of vermin such as rabbits and rats.

By a long-term agricultural policy, and by these works of restoration, the whole economy, as well as the physical appear-

ance, of rural England could be brought back to health and the essential background to racial greatness restored and even enhanced.

Upon this foundation it is possible to build up a more complex structure. The small market towns have for centuries been the focal points for shopping and entertainment, for professional advice and, indeed, for business generally. They are a natural part of the rural pattern and they are sited, generally speaking, twenty miles apart—in other words a comfortable drive for a farmer, there and back, in a day. To-day, of course, the motor has enabled the farmer to go farther afield, but nevertheless the market towns remain the local centres. It is to these that the planners of the relocation of industry should turn for sites in a rural county like Dorset, for it is there and there alone that the population of the countryside can absorb additional numbers without throwing the vital rural balance out of true. And the factories must be carefully selected to avoid dirt and noise. In this way such a county as Dorset could absorb approximately thirty new industrial undertakings. The additional population which this would bring would undoubtedly strengthen the financial resources of the county.

The foundation plan would, therefore, consist of :

- (1) A thorough-going reconstruction or reconditioning of the whole agricultural structure.
- (2) An enlargement and financial reinforcement of the existing market towns by the location of carefully chosen industries at these points.

To assist both these schemes of reconstruction it will be necessary to improve the road system in the following ways :

- (a) By the construction of the trunk road which takes the traffic across the north of the county to the west of England, or to put it in more general terms, to construct any necessary trunk roads to deal with long-distance traffic.
- (b) By the improvement of the existing classified roads with the necessary by-passes and ring roads.
- (c) By the improvement of local roads, especially with regard to lines of vision.

It should be stated here that all road proposals should not be treated as road or traffic questions alone, but should be considered as forming part of the rural scene. Hedge planting, tree planting and grass verges, for resting or even picnic parties, should be included whenever possible.

With regard to the possibilities of special industries being located in the rural areas in conjunction with special agricultural products, it is possible that small, rather specialised furniture



factories or toy factories might be sited in the woodland areas and villages. Milk factories are already abundant, and cheese factories and sausage factories already exist, and flax factories are native to Bridport and part of west Dorset. These facts, of course, refer specially to Dorset where, generally speaking, the industries natural to the district such as brick-making, pipe-making, gravel digging and china clay mining are all well developed. The small motor-repair industry might well be enlarged, especially in view of the increased number of tractors in use on the land. Small country laundries might also prove a success, sited in the larger villages and catering for a group of hamlets and smaller villages. On the whole, however, it would appear that the more fruitful industrial development will take place in the already existing market towns and that improved transport services should take surplus village labour to those factories.

It might be helpful to suggest the type of business which would be suitable for the small county town, and many, indeed, have already been located in such places, as for example furniture-making at Castle Cary in Somerset, glove-making at Yeovil and the surrounding villages, synthetic stone mantelpieces and other architectural forms at Ilminster, linen collars at Taunton and mackintoshes at Basingstoke. Other suitable types might be special biscuits, printing, leather-work, rug-making, tyre-soling, linen (near the flax fields of west Dorset), canning of lobster (near the coast), and in fact most of the light and clean kinds of businesses which can use electric power and do not generate small or polluting waste products.

It is now necessary to deal with the third function of a rural county such as Dorset, which possesses a coastline, heathlands and open downs, as a place where the urban population can be recreated. But it will be first essential to consider rural England as a place where the younger generation can be educated in direct contact with nature and the vitalising influence of the earth. For the native population the system will be the completion of the programme, started before the war, by which senior schools were sited in the more important villages to take the older students from the village schools. There is already a large programme of this nature temporarily held up by the war.

But over and above this, it should be possible for the children from the towns to spend at least the summer in the country in carefully sited summer schools, or in country houses taken over for this purpose: indeed it would be a splendid function for any of these glorious buildings that had ceased to perform their older purpose in the rural economy.

It is possible to visualise a tremendous organisation of this

nature for all ages, consisting of boarding schools on the lines of the war-time country schools for evacuated children, summer schools in connection with farming and out-of-door occupation, post-graduate schools and so on. There is an immense field for a reconstruction plan on these lines. By such means it would be possible to create a new generation fully alive to the older life of the country and having the poise which life in contact with nature generally brings. Service in the armed forces should be linked up with this educational organisation, and the youth of eighteen who does his national service should treat it as a continuation of his education in discipline and civic duty.

For the older people the country should become a place—

- (a) to rest in and be refreshed,
- (b) to exercise in and be refreshed.

For (a) it will be necessary to construct holiday camps on the coast, or elsewhere, and it would be wise if local authorities were encouraged to construct carefully designed camps which would be under their control, and from which they could derive benefit financially. In Dorset such resorts could be constructed with imagination and sympathy, but under the most stringent control; or they might be created in conjunction with some landed estate, when the house would form the administrative block and the public rooms, and the camp could be placed under the trees on selected sites in the park.

For (b) it will be necessary to construct special cycle paths which might follow the ancient tracks, and a national and rationalised system of footpaths for walkers, linked up with well-placed youth hostels. There is again in this sphere a large field for imaginative planning.

By careful control these recreative structures could be imposed upon the agricultural pattern without destroying the balance which is believed to be so vital.

In connection with this recreational organisation it will be necessary to make further improvements in the road system. In Dorset a through coastal road from east to west should be constructed or the existing roads improved and, furthermore, those lanes which have come to be used as scenic roads should have their line of vision increased wherever possible, but without any destruction of the natural beauty.

In addition, there is a large field of work to be carried out in the improvement of hostels and inns throughout the country districts, but being largely a matter for private enterprise, need only be noted here.

A summary of the reconstruction plan for a county like Dorset would therefore read as follows:

- (1) Thorough reconditioning of farm buildings, lands, cottages and village housing generally, with additional accommodation where necessary, carried out in sympathy with the local scene.
- (2) Extension of existing water supplies to serve all villages, farms and essential fields.
- (3) Drainage schemes for villages where necessary.
- (4) Location of carefully selected industries in the existing market towns with additional housing accommodation.
- (5) Scheme of road improvements, including trunk roads, with the necessary by-passes and ring roads, as well as the improvement of county roads where necessary.
- (6) Completion of the scheme of school building to deal with the existing population and construction of new schools where additional population makes this essential.
- (7) Creation of boarding schools and summer schools as well as educational centres to cater for the town population.
- (8) Creation by local authorities of holiday camps or holiday rest centres.
- (9) Erection of youth hostels and the creation of a system of cycle-paths and footpaths for ramblers entirely independent of motor roads.
- (10) Possible creation of local industries in connection with woodlands, and of local laundries and motor-repair shops in the villages.

Finally, it will be necessary to complete the electrification of the countryside, for upon this will depend much of the amelioration of living conditions both on the farms and in the cottages which is an essential object in the reconstruction of life in the country after the war. Facilities also should be provided in the larger villages for travelling cinemas and theatre companies; this might be done in conjunction with the senior schools. The provision of first-class transport services will complete the modernisation of rural conditions and will indeed help to make the amenity side of country life comparable with that now realised in the towns.

In short, the country will take its rightful place in the considered and balanced national plan.

# THE DEVELOPMENT OF A NATIONAL COASTAL PARK IN NORTH CORNWALL

by

G. CEDRIC PAGE, F.S.I., M.T.P.I.

WHAT is a National Park? Every town has its public gardens, recreation grounds and open spaces, so too, the nation should have its National Parks. In the past it has been left to the people of Britain to find their own places for holidays, rest and recreation, only to watch as time goes on the spoliation of these treasured beauty spots by speculators.

Time and again some of the most beautiful scenery has been ruined by exploitation, and other areas only saved by such bodies as The National Trust and Council for the Preservation of Rural England, through the generosity of public-spirited men.

Let Britain realise that its lovely hills and valleys, quiet rivers and rugged coast are its inheritance handed down by generations to the British people, and not to the selfish few.

There are many districts and sites which could qualify for their inclusion as National Parks, such as the Lake District, the Norfolk Broads, Dartmoor and the Cornish Coast to mention a few, each in its way appealing to sections and moods of the population. Let us consider just one of these, the North Coast of Cornwall.

## REQUISITES OF A COASTAL PARK.

A Coastal Park must possess the facilities for both rest and recreation; rest in the quiet and solitude of lonely stretches and sheltered coves, and recreation in the large expanses of golden sands, providing bathing, surfing and the impromptu games enjoyed by young and old alike. The North Coast of Cornwall provides these, being of sufficient length to meet the wishes of all.

This coast has a variation of massive grey cliffs, rising more than 700 feet, to long stretches of sands; from wild windswept rocks towering hundreds of feet above a storm-tossed foam below, reached only by narrow paths, to peaceful wooded valleys running down to little beaches along twisty narrow lanes.

To provide for the section of the community that desires concerts, theatres, cinemas, fun fairs and amusement parks, would not be within the scope of the North Cornish Park. Many seaside resorts provide these entertainments, and those whose ideas of a holiday are on these lines will patronise such

places. It should be left to the existing towns and urban areas, rather than the State, to cater for the holiday wishes of this large section of the population.

The Park will, of course, adjoin and abut on to some urban districts. Bude is a growing holiday town, with promise of becoming extremely attractive as it develops. It has facilities for golf, tennis, cricket and other games, besides stretches of sand which are a great asset to its popularity.

A Coastal Park needs a centre such as this, and conversely the town, while not perhaps needing the Park, would be greatly benefited by its proximity. One is complementary to the other.

The appeal of the Cornish Coast is more to those who appreciate the natural, rather than the artificial seaboard. To those whose lives are spent in large cities amid the turmoil of modern times, the peacefulness and spaciousness of this coast is a reaction providing a true holiday. Being comparatively scarcely populated, it has retained the beauty which Nature has given it, and as such, has an attraction for a growing element, encouraged to appreciate and therefore understand, how lovely Nature can be.

Nor is such a Park confined to those who require solitude. Long stretches of sands are capable of development, giving very good facilities for bathing, surfing and the more energetic forms of recreation. Sites for holiday camps and camping grounds can be selected, and the juxtaposition of urban areas fulfils the needs for those who find enjoyment and pleasure in the company of others.

#### LENGTH AND DEPTH.

The length of the actual coastline is roughly thirty-three miles, but this is a conservative figure, since the small inlets and creeks are not included.

There are, in this length, three breaks in all. One at Port Isaac where this fishing village has of course been built immediately adjacent to the sea; one north of Coombe by Bude, which is War Department land, though this may later be available for inclusion, and the third at Bude itself. Much of the coast at Bude is owned by the Council, so although it is not included in the National Park, the stretch of cliffs available to the public should not be broken.

The depth varies enormously. The inclusion of the woodland at Coombe and Millook takes the Park up to one and a half miles inland, and near Delabole, to a similar distance, if the valleys are included and parkways constructed to the sea. At the other end of the scale, the road between Millook and

Widemouth runs almost on the cliff edge, and the depth here would be measured in yards.

The average depth can be taken as between a quarter and half a mile, and the total area roughly 8,300 acres.

The National Trust own certain lands on this coast, and these have been included in the figures quoted above.

There are some factors which may make it advisable to increase the depth. One is, as mentioned later, the possibility of adding more land to make an economical farm. Another is the danger which might arise through buildings being erected on the boundary of the Park, and being injurious to its amenities. It might be found desirable to construct a parkway down a valley which has increased in popularity, and more land would be required to connect this to an existing road.

#### DEVELOPMENT.

To meet the requirements of the different sections of the community, it will be necessary to carry out certain works. For those who enjoy the sands and beaches, provision must be made for large car parks, bathing huts or changing rooms, and possibly the construction of bathing pools for children.

In a suitable position near the beach could be constructed a large building. This would serve as a restaurant, filling station, repair shop and could include changing rooms and public conveniences. Apart from meeting a necessity, it would also serve as a source of revenue.

Works of this kind should, of course, be carried out gradually, and such an undertaking must be run on sound business lines.

The first cost will be that for the actual land and buildings, and this being completed, the farms and agricultural land should be organised as economical undertakings.

The next step is the provision of large car parks, commencing with those areas which have proved their popularity. At the same time one or two of the restaurants might be erected, not as the completed building, but sufficient to meet the present demands, allowance being made for extension. Camping fields should also be provided with water and temporary disposal works.

A certain amount of revenue will be accruing from the farms, tenements, car parks and restaurants, and gradually those buildings scheduled for demolition could be removed.

Improvements to the roads leading to the Park will now be necessary, and work on some of the more dangerous or narrow stretches should be undertaken.

With the increasing popularity of the Park might be undertaken the construction of the holiday camp. Here again the

complete camp need not be built at once, although it is likely to be in great demand, and every effort should be made to make it as attractive as possible.

With the holiday camp, the camping sites should be provided with the necessary drainage works, assuming that temporary disposal works were first constructed when these sites were laid out with the car parks.

Some of the new roads in the Park itself might be constructed as the next item, and at the same time one or two of the parkways leading to the better traffic routes could be developed.

The remaining restaurants, filling stations, parkways and road improvements would complete the original planning. It would not be correct to say "complete" since constant improvements, amendments and additions will be necessary as time goes on.

This gives a rough picture of how a National Park, from its present state of agricultural land, rough cliffs and inaccessible beaches, could be developed over a period, bringing immense pleasure to a great many lovers of the West Country.

#### EXISTING VILLAGES AND SETTLEMENTS.

One problem in the setting up of a National Park is what the position should be of existing settlements and buildings. It is obvious that some buildings will be included, and even hamlets or small villages, depending on their value in increasing the harmonious blending of the whole Park.

Generally speaking, the Cornish built their small communities in the valleys; the reason, when constructed for fishing is obvious, and one finds the houses clustered round the head of the creeks forming the harbours.

There are one or two small hamlets which would add considerably to the Park. These consist of not more than a dozen buildings, and are picturesque either through their antiquity, the inclusion of woods, or both.

Coombe, north of Bude, consists of some half-dozen buildings including a mill. These are thatched, set in a wooded valley, with a small stream coursing through the well-planted gardens and hedges. The one small lane is too narrow for ordinary vehicular use, and the sudden quietness and peace in which the visitor finds himself is enhanced by the scent of wallflowers, lilac and other plants growing in profusion on the banks.

Millook, some few miles south of Bude, is another small settlement having possibilities of development. Its approach is difficult until one becomes used to steep gradients and hairpin corners, but the crossing of the ford causes no trouble. From the beach, enclosed by steep cliffs on either side, runs a winding valley timbered on its slopes. The few buildings near the

beach would be ideal for hostels, and the inclusion of the valley would, as at Coombe, make a contrast to the cliffs and sea.

These are just two examples of existing hamlets, the inclusion of which is essential for the full benefit to be derived from the Park as a whole.

Existing farms included in the Park should remain as agricultural holdings. In cases where only a portion of the farm is within the Reservation, it would be well to extend the Park, including sufficient land to ensure an economical size, although such extra land may have no scenic value. This would mean that the farmers would become tenants of the State. Where only small areas of rough pasture are scheduled to be included, these could be let to the farmers for their original purpose, but in some cases the purpose of the Park might take priority over poor-class pasture land.

Buildings, generally of the small class, and built of materials foreign to the district, making them entirely out of keeping with the district, should be demolished. Some of cheap timber construction, bordering on the term of "shack", can find no place in a coastal region set aside as a National Beauty Spot. While one may sympathise with the owners who, for a small outlay of capital, can live and enjoy the beauties of this Cornish coast, the buildings are undoubtedly a serious blot on the landscape, and their removal, while injuring one or two people, would be beneficial to the enjoyment of thousands.

The suggested Park has been kept on the seaward side of existing buildings as far as possible, and although this may reduce the depth in places, the additional cost of acquisition would not necessarily prove of sufficient value.

#### HOLIDAY CAMPS AND CAMPING.

Camping under canvas is the true holiday for an increasing number of people. Others prefer the caravan, and the holiday camp is a recognised form of spending a well-earned rest. There are, however, many who consider that holiday huts and tents are a form of spoliation, but the pros and cons will not be discussed in these notes. It must be accepted that these forms of enjoyment have come to stay, and it is better to allocate certain areas for them.

Fields a short distance from the cliffs and in the valleys could be set aside for camping, and regulations governing the pitching of tents should be strictly enforced.

Water and drainage must be provided. A number of stop-taps spaced about the field will be necessary, and in one corner, screened by bushes or tamarisk, should be built conveniences with its own small disposal works.



A holiday camp should be situated not too far from a town. The rainfall in Cornwall is heavy, and ease of access to a town with its concerts, cinemas and other indoor amusements, is a great asset. As in the case of the camping fields, it should not be immediately adjoining the cliffs, but a short distance up a valley within easy reach of a beach.

Such a site is at Northcott Mouth, one and a half miles north of Bude. There is road access; it can be built in a valley sheltered from the wind, and the problem of drainage can be overcome by pumping over the brow of the hill into the town's sewers. Although such a system may appear expensive, the sewerage of a large holiday camp might cause unpleasantness on the beach.

The camp should be constructed as a National concern by the Government or Central Planning Authority. The huts can vary in size, but should be grouped and harmonised. A very pleasing effect is obtained by the use of cedar shingles. As a central feature, a large building, constructed of similar material, would accommodate the dining hall, kitchens, lounge and recreation rooms.

Tennis courts and a miniature golf course are really essentials, and provision can be made for other sports as the camp develops. Hard courts can be laid out on the roof of the garages, as ample space for cars must be made.

A suggested design for such a camp is shown (see pages 64 and 65), and it will be noted that the huts are arranged to give each some view of the sea or cliffs.

Advantage has been taken of the small stream running down the valley. Three pools have been shown on the plan, and could be laid out for fresh-water bathing, ornamental garden and as a children's pool for model boats and such-like.

A number of trees have been planted to screen and enclose the camp, partly as a protection against adverse winds. These will not interfere with the view of the sea and cliffs, and those along the main entrance are sufficiently widely spaced to give the view and provide an amenity to the camp.

Each garage will allow ample accommodation for all the cars likely to be brought by visitors. Sections of one or both would be set aside as a repair shop and filling station to serve the needs of the camp. The rear of the buildings would be in excavation in the sides of the hills, so that the tennis courts on the roofs would be on the level of the adjoining ground. Four courts can be laid out on each building in a north-and-south direction.

The existing building at the entrance to the camp could be taken over and utilised as the administration block and accommodation for the warden in charge. Alternatively it could be

converted into a café to serve the ordinary visitors to the beach. Its position is well suited to the former proposal. The two other existing buildings should be removed, since their position and construction would not harmonise with the buildings of the camp.

The huts are shown somewhat widely spaced, which would give more view to others farther up the valley. The number would give accommodation for some 200 to 250 people, and could easily be enlarged when necessary.

There are, of course, other designs, but that shown is an example of how a camp in this particular site could be laid out on pleasing lines affording spaciousness and freedom to the residents. Being in the valley it would not be an eyesore to those who consider a holiday camp a form of spoliation, yet it is sufficiently close to the sea to give the maximum enjoyment to those desiring this form of holiday.

#### ROADS.

Good roads lead from Launceston either northwards to the Bude district, or westwards to Camelford. From Plymouth it is advisable to travel northwards, unless the western end of the Park is the destination, in which case the road takes the traveller through the Glynn Valley between Liskeard and Bodmin, one of the most beautiful roads in the county. It is also possible to reach the Park over the Bodmin Moors, either on a main road or by cross-country lanes.

A certain amount of works of improvement and even new roads in some places will be necessary. The degree of benefit as a traffic route and of development of the Park will be a question to be considered on financial grounds.

The main road from Wadebridge to Bude via Camelford lies parallel to the coast, and is never more than about five miles from the Park—generally much less. There are also other classified roads between this and the sea, notably that from Polzeath through Delabole to Camelford and Boscastle, which is within a mile or so for most of its length.

The improvements which will be necessary are from these classified roads to the actual Park itself, and along its length.

North of Bude little will be required, except that by Coombe and to Northcott Mouth. Both these roads must be widened in places, and corners eased, though not to the extent of making them into traffic routes. That leading to Northcott Mouth is insufficient for two cars for most of its length, and will obviously require widening if a holiday camp is to be established.

Since it is intended to preserve the northern section of the Park largely as it is, the roads and lanes serving it should also

be kept mainly as byways, and improved only sufficiently on grounds of safety. The whole effect could easily be ruined unless care is taken to make improvements only where they are essential.

The coast road from Widemouth to Crackington Haven is difficult, being narrow, steep and twisty; hairpin corners occurring on gradients in the region of 1 in 5. Sections can quite easily be widened on the landward side, though the cost may be high since in places it is in deep cutting.

The possibility of constructing a second carriageway, not necessarily on the same level, should not be overlooked, and this would seem to be the only solution to the northern entrance to Millook. The southern access to this place can certainly be improved by easing the hairpin corners, though if this was found to be insufficient it would be possible to construct an entirely new road up the valley to rejoin the existing road farther west. Whether or not it would be desirable to keep traffic away from the valley is a matter of opinion. Without a road it would be quiet and attractive to those who desired the reaction from the sea, but on the other hand it would open up a very pleasant area to many more visitors.

The road from Crackington Haven forming the boundary of the Coastal Park by High Cliff can be improved by a slight increase in the width of the carriageway taking in some of the grass verge. Along this stretch, the "hedge", e.g. the Cornish wall, could be reduced in height, so allowing the views over the cliffs to be appreciated. In order to prevent cattle and sheep from straying, it would not be a difficult matter to dig a ditch or trench on the field side, so bringing the hedge to its original height. This applies to other stretches of roads and would undoubtedly prove of considerable benefit to those using them.

On lengths such as these, small parking places or "draw-ins" should also be provided, especially where footpaths exist or could be constructed to the cliffs. These should be as numerous as possible, even though accommodating only two or three cars.

At Newton, on the southern end of the length of road just referred to, is a typical example of where a new length might be constructed, linking up with a further stretch from Beeny.

There is little to be said regarding the other roads except at Portquin, where improvements for some distance will be required. Generally speaking, the roads north of Bude should be left as far as possible as small country lanes, so that the character of the area is not changed. At the southern end, which may be more popular with a larger number of visitors, the widths should be increased, and visibility on corners and danger points improved, to accord more with the volume of traffic using them.

### PARKWAYS AND FOOTPATHS.

The term "parkway" has various interpretations, but that implying a wide belt lined with trees would not be altogether appropriate to the North Cornish Coast. As a whole, trees will not grow satisfactorily, except in the valleys.

The development of some of these valleys is desirable from what is now more or less barren land to wide turf paths lined or dotted with trees on either side of the streams. Between Port Isaac and Delabole are a number of such valleys which would lend themselves to this development. Where the sides of the valley are not steep, a very pleasing effect could be obtained by constructing a road by the side of the stream running down to the beach. This would open up further portions of the Park to those who, by reason of age or infirmity, would otherwise be unable to reach them.

This stretch of coast is fortunately blessed with a number of footpaths, and the owners of the land adjoining the cliffs deserve a word of tribute for permitting so much freedom. Visitors have, however, not always shown their appreciation, and some farmers have had to close their land to prevent cattle from straying. The construction of stiles and "Kissing Gates" can be an unnecessary expense, and at times visitors wander away from the path and do considerable damage to crops and ripening hay.

Paths along the cliffs require no fencing as a rule, since the land is rough pasture, and stiles are made in the Cornish hedges. These should be left as natural as possible, which of course applies to the whole area.

Improvements to these cliff paths will be necessary, as in some cases they are very near the cliff edge, and are a source of danger. Those actually on the cliff face leading down to the beaches below will require attention in recutting steps and slopes from the rock. The building of steps in concrete is to be deprecated, and should only be resorted to where the rock is shaly, or its contour likely to lead to the edge breaking away. These steps and paths will need constant attention, as the cliffs may slide and crumble slightly in places.

A great number of footpaths will be required to lead from the roads and parking places to the cliffs. These should be laid out along the field boundaries, so that the interference with the agricultural use of the land is reduced to a minimum. It might be advisable to construct a low Cornish hedge on the field side, which would be just sufficient to provide a boundary to the path and field.

Stiles and gates in the paths will, of course, be necessary, and

they should be as foolproof as possible. Small direction signs, indicating the public path, need not be out of keeping with the Park, as witness those erected by the National Trust.

#### ADMINISTRATION.

While as much freedom should be allowed as possible, it is obvious that control must be exercised, and questions regarding farm and property management should be dealt with on the spot.

It would be advisable to set up an Estate office, which would be under the direction of a Steward, responsible for the management of all the farms, hostels, camps and property in the Park. He would also be in charge of the development of the parkways, construction of holiday camps and enlargements, new roads and their maintenance.

Under the Steward would be the managers of the holiday camps, hostels, and the cafés and restaurant buildings situated near the more popular beaches.

There should also be Wardens or Rangers, who would have sections of the Park under their care. These men would see that camping sites are in order, prevent camping on stretches not set aside for this purpose, and do the small repairs to stop-taps, sewage disposal plants and so forth. They would also be responsible for repairs to hedges, gates, stiles and paths in their sector. They would be always on the site, and would be a great help to visitors and campers as a source of information. Also, being responsible for a comparatively small section, any slight crumbling of the cliffs would be instantly seen, and danger averted.

These Wardens or Rangers would be accommodated in the Park, and possibly an existing building could be used for this purpose. The cost of construction of a small cottage would not be a big item, should an existing building not be available.

#### FINANCE.

To deal with the question of cost would take a volume in itself, and any even approximately accurate figure could not be given without a detailed survey and careful planning of the development of the Park. The proportion of the cost to be borne by the State and the Highway Authority, in the construction, improvement and maintenance of the necessary roads is a point which would amend any figures which might be quoted.

The acquisition of the actual land depends largely on the future legislation dealing with Planning. Even assuming that it is zoned as Coastal, it is not yet decided whether the Minister

of Health (or Planning) will include all the land so zoned as exempt from compensation. It may be argued that some of the land has a building value, and offers to purchase produced as evidence. The Minister must, under Section 19 of the present Act, have regard to the interests of persons who would be affected, as well as the objects of the Scheme, before approving the provision excluding compensation.

The number of existing buildings to be purchased may require amendment after the area has been surveyed in detail. Many of these would not, of course, be a loss, since they would be utilised as hostels, cafés, and let as tenements. Some would require complete demolition, but these are mostly of the small class and of cheap construction.

The buildings erected as cafés, restaurants, filling stations, etc., while perhaps being of fairly high initial cost, would soon be a source of revenue, and repay the building charges if run on sound business lines.

The car parks will not need such good foundations, generally, as a highway, since the speeds of vehicles will not have to be contended with.

It is difficult to give a cost-per-acre figure for the land. In places this might have a deferred building value, other areas may be good agricultural land, while other portions are rough pasture. As a rule the cliff land is very poor for agricultural purposes, and in places almost useless. If a figure of £30 an acre is taken, this should be a fair all-round price over the whole stretch.

The figures given below are very approximate, and should be taken as a guide only.

Purchase of land—8,300 acres at £30 per acre . . . . .	£249,000
Purchase of buildings—60 at £700 each . . . . .	42,000
Cost of erection of restaurants, cafés, etc.—4 at £6,000 each . . . . .	24,000
Cost of construction of holiday camp, including roads . . . . .	21,600
Cost of construction of parking places . . . . .	15,400
Cost of parkways and new footpaths, including repairs to stiles and gates . . . . .	50,000
Cost of improvement of roads, including new lengths and/or dual carriageways—28 miles at £30,000 per mile . . . . .	840,000
Total . . . . .	<u>£1,242,000</u>

It must not be assumed that this capital expenditure would be necessary as a lump sum. Indeed it would not in any way be wise or practical to embark on such a vast scheme.

It will be seen that the major item of this figure is the cost of road improvements, which are actually almost entirely outside the Park itself. It is doubtful if this expenditure could really

be attributed to the cost of the development of the Park, but it is included as an item to be borne for the full enjoyment to be obtained.

#### LEGISLATION.

This subject is only referred to briefly, and confined to the Town and Country Planning Act, 1932.

This Act does not give the Minister of Health any powers to acquire land directly for the purpose of an Open Space. It is possible for a Local Authority or Joint Committee, as the Responsible Authority, to purchase land reserved as Public Open Space in an operative scheme, but this would be a local or, at most, a regional matter. The cost which would fall on the Local Authorities concerned in the land under consideration would be too great a burden, bearing in mind the small amount raised by a penny rate.

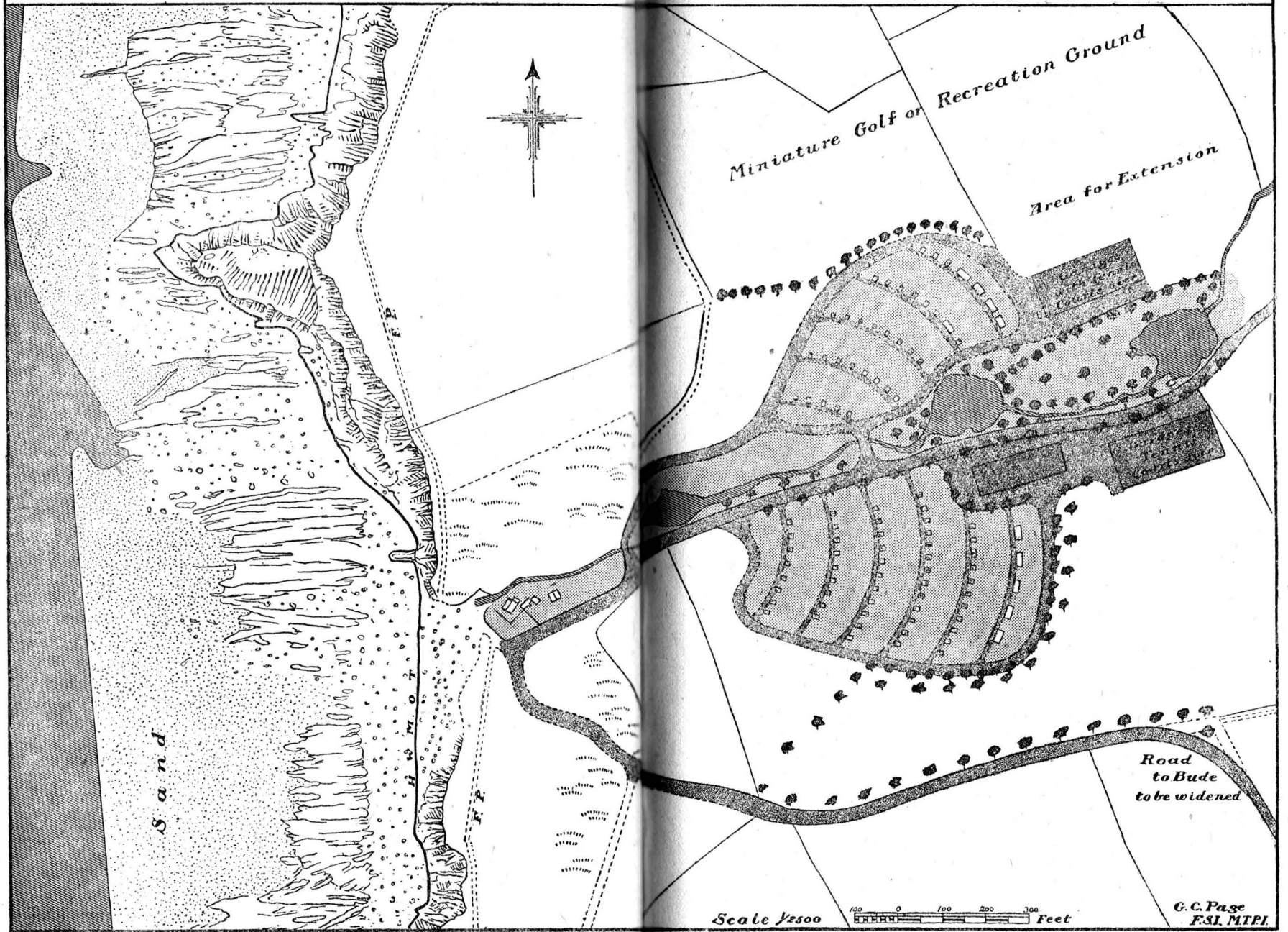
Under the heading of Finance, it was mentioned that the land could be zoned as Coastal. This permits no buildings, except with the express consent of the Responsible Authority. No land is actually acquired, and the owner may do as he pleases other than build. Although this does largely sterilise the land, it would not prevent the erection of agricultural buildings, including labourers' cottages, nor the winning of minerals, and the land would not be open to the public.

The Coastal Zone, being a zone and not a reservation, does still give the owner the hope of building, hence the probable exclusion of compensation. The disadvantages of this zone are immediately apparent. If an application to build is submitted, it is at the discretion of the Responsible Authority whether it is approved or otherwise (there is appeal to the Minister), and the future of an area of coast of vital necessity to the nation should not be in the hands of local interests. At the most this zone can only be a temporary measure, since its very term of zone and not reservation implies that it has or may have in the future a building value.

The legislation which will be required must give the Minister responsible for Planning, the power to acquire and develop for the nation the necessary land for National Parks.

One other point only is mentioned regarding legislation, and this is that the Minister should be empowered to define an area, adjoining National Parks, in which no building or work shall be commenced without his consent. If a road formed the boundary of the Park, the land opposite might become "desirable building land", with disastrous results to the amenities.

# NATIONAL COASTAL PARK SUGGESTED HOLIDAY CAMP, N. CORNWALL.



Scale 1/2500

0 100 200 300 Feet

G. C. Page  
F.S.I. M.I.P.I.

[See page 57.]



# MAPPING FOR INVESTIGATION OF SETTLEMENT POSSIBILITIES

by

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THE purpose of the mapping is to show the distribution and extent of certain types of surface unsuitable or not available for the development of urban settlements, and also of certain more or less fixed elements of the landscape, of which the planner must be aware and take cognisance as the framework within which new planned elements must be fitted.

The surfaces classed and mapped as unsuitable for settlement vary in this respect from those, such as water-surfaces and tracts already built up, which are absolutely eliminated to those, such as highland and woodland, which in varying degree are relatively unsuitable, because of the initial cost of development and/or because of permanent disabilities and inconveniences to life on such sites which would persist. In such cases it is not possible, nor indeed would it be particularly desirable, to define exact physical limits; rather is it important in the first place to know where such disadvantages occur. It can be decided later whether there are any overriding considerations making it worth while to overcome the initial obstacles or submit to the permanent disabilities.

The maps are being prepared on a uniform scale of one inch to one mile (1/63,360) [following the sheet lines of the O.S. Popular Edition] on tracing paper, so that by superposing the tracings different sets of distributions for a given area may be correlated and their cumulative effects demonstrated.

## I

- (a) Rivers and other water-bodies are shown in BLUE.
- (b) Highland.

Land higher than 750 feet above sea-level is indicated by insertion of this contour-line in BLACK.

Highlands usually have a greater proportion of rough surface and less free access than lowlands, and in addition altitude itself imposes disabilities through its effects on climate. It may be assumed that in Britain land above a height of some 700 or 800 feet is, except under specially favoured conditions of shelter and

aspect, relatively unsuited for settlement because of inclement climate. This is reflected in :

- (i) Reduced temperatures, perhaps most evident in the lengthening of winter, and the higher proportion of snowfall in the total precipitation.
- (ii) Heavier total precipitation and its more frequent occurrence, with accompanying greater cloudiness.
- (iii) Generally greater exposure to wind.

(Liability to winter snowstorms is a real deterrent to the location of industry in highland areas of Britain, because of interruption of communications.)

In their higher parts, above approximately 1,500 feet but sometimes lower, highland surfaces in Britain, except on the small tracts of calcareous rocks, or where slopes are steep, are, under the prevailing climatic conditions, ill-drained and covered with peat.

(c) Steep slopes.

Land sloping at a gradient steeper than 1 in 7 is SHADED IN BLACK.


Such slopes have been determined by measurements of the spacing of the contour-lines on the O.S. 1/63,360 maps (on which contour-lines are shown at vertical intervals of 50 feet). This shading shows the direction of slope and the extent of such sloping surfaces, but does not attempt further to distinguish varying degrees of steepness.


Not only are steep slopes themselves unsuitable as sites for effectively laid-out settlements, they are restrictive elements in other ways :

- (a) By impeding access to other flatter surfaces,
- (b) By limiting or directing the form and extension of juxtaposed settlement ; and, in combination with relief in the strict sense, by causing shade if the aspect is unfavourable.

Thus smoother tracts which may exist between deep, steep-sided, narrow valleys are relatively inaccessible, at least from certain directions, while the valley-floors themselves, even though they may be flat, are too constricted to be desirable sites, and unless their orientation is favourable suffer from the further disadvantage of reduced potentials of light and sunshine.

(d) Recent alluvium.

Flat stretches of recent alluvium are shown by the symbol .

In the preparation of these maps, the O.S. maps on the scale of six inches to one mile were not available to indicate more precisely the extent of tracts along river-courses that are liable to periodic flooding. Exceptional floods, however, inundate much greater areas than those shown on the six-inch maps as liable to flooding. It has been considered advisable to map the extent of flat stretches of recent alluvium, as shown on the Geological Survey one-inch-to-one-mile maps, and excluding terraces. Much of this land is unsuitable for building by reason of liability to flooding, poor drainage, and/or insecure foundations. In any case, almost all of it, with the exception of some marsh, is actual or potential meadowland of the first quality. Tracts of peat, as shown on the Geological Survey one-inch-to-one-mile maps also, are distinguished by the symbol .

(e) Woodlands are indicated in GREEN.

For the sake of clarity they are shown on a separate map in the case of sheets which already include a considerable amount of material to be entered under other categories.

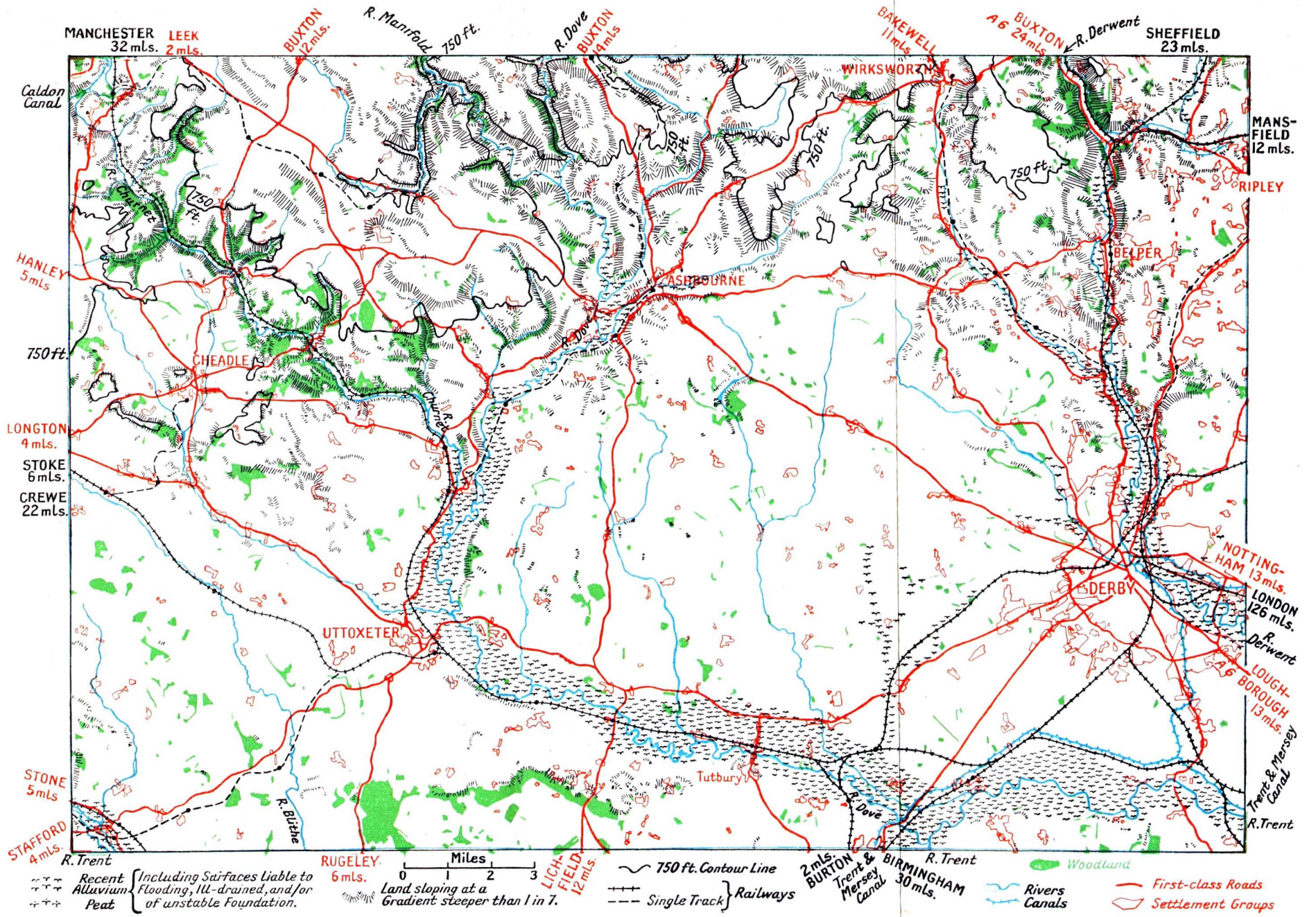
The numerous scattered small coppices of course need not individually be regarded as fixed elements of the landscape. But, apart from the heavy cost of clearing and preparing extensively wooded sites for settlement, it is highly desirable in a country already so largely deforested to preserve existing woodlands—not only because of the intrinsic value of their timber, but also because of their importance in regulating drainage and run-off, and in contributing to the landscape an element of considerable æsthetic value.

There is often, it may be noted, a definite and close correspondence between wooded and steeply-sloping surface. So that timber-cover reinforces the unsuitability of the steep slopes as settlement sites. As some of our finest scenery is associated with well-wooded and deeply incised valleys, e.g. Dovedale, the very factors that render such country unsuitable for settlement give it an æsthetic and amenity value which it is important to preserve.

## II

(a) Settlement groups.

Existing settlement-groups are indicated in RED, the limits being drawn to include not only the actual



area occupied by buildings, but also parks, gardens, allotments, and market-gardens where these are interspersed among or contiguous with the built-up areas. Isolated individual settlement units are not shown, especially as their inclusion would to some extent tend to obscure the major elements of the settlement pattern.

(b) Communications.

On the assumption that, with the possible exception of national schemes for new trunk roads, future transport developments will be mainly along existing arteries of circulation, the network of communications may be regarded as a relatively stable feature, although one that is capable of and liable to adjustments and insertions. As such it is of great importance for the planner to know the position of lines of communication in relation to other features.

*Roads.*—First-class roads are shown in RED, following the symbols of the O.S. one-inch-to-one-mile maps. Roads which by reason of narrowness, surface character, or windings are not in this category have not been shown, although it is to be noted that some such roads are capable of having and likely to have their status raised.

*Railways.*—Railways are shown in BLACK, those with only a single track being distinguished by broken lines.

*Canals.*—Canals are shown in BLUE. Though certainly of much less importance for consideration in planning than roads and railways, canals provide a cheap form of transport useful for certain industries. In Britain they are essentially an inheritance from a past era of communications, and as such are unlikely to become available where they do not at present exist.

### III

Another section or sections which we have not as yet been able to undertake will require the mapping, as areas to be eliminated for purposes of settlement, of such lands as the following:

- (a) Those already occupied or "earmarked" by the Forestry Commission, and other forests.
- (b) The water-gathering grounds of the many urban water authorities.
- (c) Lands in the possession of, or partly controlled by, the National Trust for purposes of historic interest and natural beauty.

- (d) Other areas which may be considered suitable and desirable for national parks.
- (e) Airfields and areas in their vicinity that are seriously affected by the nuisances caused by aerial operations.
- (f) Areas adjacent to factories engaged in atmosphere-polluting or dangerous works, e.g. certain chemicals, explosives.
- (g) Most important but most difficult to determine, areas of actually or potentially first-class agricultural land.

All such areas as these are to be excluded from the areas suitable for the development of new settlements. They may, of course, overlap one another and some of them overlap areas already excluded for physical or other reasons.

# AGRICULTURE

## ECONOMIC UTILISATION OF LAND IN PLANNING PROCESSES

by

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ONE feature of current ideas about planning land uses is that in future plans for residential or industrial development "the best" or "high quality" agricultural land shall be reserved for agricultural or horticultural purposes. This idea is in many respects laudable, but it appears to arise largely from sentiments about agricultural lands and from vague fears about reduction in the productive powers of land under cultivation in relation to national needs. It tends to exhibit a somewhat one-sided view of the problems of land utilisation.

The aim of planning land uses must be that of securing maximum utility in the use of all the land available for the many and varied uses to which it may be put. These uses can be divided into two main groups; (a) Agricultural (cultivation and cropping including horticultural, pastoral, and forestry). (b) Non-agricultural (including transport of all types, building for residential, commercial and industrial purposes, with use of land for recreational purposes in association with residential developments).

The economic productivity of agricultural land depends upon two sets of factors, (a) geophysical, (b) economic-social. At some points the results of these two sets of factors have become entirely merged. The present qualities of the surface soil for production are the result of the original qualities of the site and the soil and of human activities on that soil for many generations. But the two sets of factors may be separated to a considerable extent in a preliminary consideration of the economic productivity of land.

The geophysical factors are:

(a) Soil and sub-soil,<sup>1</sup>

<sup>1</sup> Professor J. A. Scott Watson has written: "The fertility of the soil depends on a variety of factors—adequate drainage, a satisfactory lime status, adequate supplies of plant food (nitrogen, phosphate, potash and minor elements), efficient tillage, the proper control of weeds, plant diseases and pests, and the maintenance of a certain humus content." There are also biological factors, fungal and bacterial, to be considered.

- (b) Altitude,
- (c) Aspect,
- (d) Exposure to winds,
- (e) Degree of slope,
- (f) Rainfall,
- (g) Drainage and natural water supply,
- (h) Temperature,
- (i) Average yearly dates of last and first killing frosts (or length of the spring-summer-autumn growing period).

It is recognised that these are not always separate and simple factors. Rainfall will vary to some extent with altitude. Aspect and degree of exposure to wind are often but not always the same. Average summer and winter temperature will vary with altitude and with drainage, but also with aspect. The length of growing period will vary with altitude, aspect and drainage. Certain quantitative measurements of each factor are possible and for most of them such measurements have been made. But no system of weighting these factors seems to have been devised and used. It is recognised that the importance of each of these factors will vary for different lines of agricultural production, and that if an attempt were made to weight these factors to obtain a single measure or index of potential physical productivity of any area of land the systems of weighting would vary for some different lines of agricultural production. This, however, is merely to say that types of agricultural production have been evolved to fit the combination of these factors on any given site, and the fitting has been done on man's judgment and experience of potential productivity arising from the combination of factors. There is also the further qualification that for some purposes, under certain conditions, man himself modifies the operation of these factors. So that in a system of weighting the factors in the assessment of potential physical productivity of any area of land account might have to be taken of the cost of modifying any one or more of the factors. Again, this is not introducing any new idea, for in practice the possibilities and costs of modification are often taken into account in considering potential uses of land.

For effective planning it is necessary to use measures of present and potential productivities of land, and the fact remains that there is no system of obtaining single measures, or indices,<sup>1</sup> of potential productivities of land under different agricultural uses. Such indices may be relatively easily determined at extremes, but in between the extremes very close measurements of some

<sup>1</sup> For instance, as to say that the index of potential production of one area is 100: of another 80: of another 40: of others 10 and 2. Such extreme ratios would almost certainly be found.



factors may be necessary. Some such measures have obviously been taken in practical forms in the processes of determining present agricultural uses of land. Perhaps the best measures take the form of present uses and present yields but these do not rest on geophysical factors alone.

Perhaps a consideration of social factors should start with the governing conditions in land use—the needs of the people, in foodstuffs and raw materials produced by cultivation, extraction of the contents of the earth by quarrying and mining, and use of the surface for building and transport purposes, but this extends far into the sphere of non-agricultural uses which are to be discussed below. In determining agricultural uses of land the dietary of people, and changes therein, and alternative sources of supplies (in the case of Great Britain, overseas sources) are of primary importance.

Some specific *economico-social* factors are—

- (a) General relation of site to human settlements (sizes of adjacent settlements, distance from nearest settlement).
- (b) General transport facilities, all grades from farm or local roads to national systems, road, rail, etc.
- (c) Distances to specific markets and transport facilities.
- (d) System of occupation of land for production.
  - (1) System of ownership and owner's interest in providing and maintaining permanent equipment of land for production, with ability to invest in equipment or maintenance.
  - (2) System of tenancy (or occupation) for production, tenants' (or occupiers') interest in providing and maintaining movable equipment for production and ability to invest in equipment.
- (e) The general stage of technical development in agriculture and stages of technical development in specific branches of agriculture.
- (f) Alternative sources of supplies of different commodities, costs of those supplies, and different degrees of competition in markets for specific agricultural products.

Again, these factors are not always simple and separate. Each could be, however, subject to certain specific measurements. Again, no system of weighting the factors has been devised and used.

When account is taken of both the sets of factors involved, geophysical and existing economico-social conditions, there is certainly no accepted system of analysing present productivities of different areas of land and determining what parts (or what variations) are due (a) to specific geophysical factors or the whole set, (b) to specific economico-social factors or the whole set.

As considerable changes in uses occur while the fundamental geophysical conditions remain more or less constant, the main causes of changes have to be sought elsewhere.<sup>1</sup> The most important fact is that generally in the temperate zones, and particularly in the specific case of Great Britain, the dynamic factors in the uses of land are the economico-social. They cause the main if not all the changes in uses and in degrees of productivity.

The main factors in determining the uses of land, and its productivity, are man's needs and capacities. Man cannot afford to allow geophysical conditions to control uses of land, for that would retard if not stop social evolution. On the other hand, in order to use his productive powers economically man always makes some adjustments of his productive enterprises to the more and less favourable of geophysical conditions.

When present agricultural uses and present yields of different areas of land are taken as measures of present or potential productivity it must be remembered that these uses rest on and partly arise from :

- (a) Natural qualities of site and soil,
- (b) Modifications of site and soil by human uses (casual modifications) and for human uses (designed modifications),
- (c) Lay-out and equipment of fields and farms—historical, recent, and current.

The processes of modification and equipment are continuous, backward and forward. They are markedly retrogressive in a few areas, markedly progressive in a few areas. In many areas there are some which appear to be retrogressive combined with others which are progressive. Changes or modifications occur which appear to be of the character of deterioration or regression but which are necessary to general progress.

Present yields immediately rest on and arise from—

- (a) The site and soil,
- (b) The permanent equipment in drains, fences, buildings, roads,
- (c) Seasonal and crop rotational inputs,
  - (1) Labour (managerial, manual, equine and mechanical),
  - (2) Raw materials (seeds, fertilisers, insecticides, fungicides, and, in the case of livestock, of externally produced feeding stuffs taken on to the area in question.

If another analysis is preferred, present yields rest on and arise from :

<sup>1</sup> Men's activities in modifying some of the geophysical conditions are mentioned below.

- (1) Land.
- (2) Quantities and qualities of investments in "sunk", "movable" and "circulating" capital.
- (3) Quantities and qualities of the human factors, "managerial" and "manual", engaged in production.

But the determination of yields is not a simple matter. There is no common measure of physical yields of crops and livestock products except that of their calorie values. The simple common measure which is applied is that of cash values. But in the use of these measures there is no accepted way of determining what parts of the product are due to land, to capital in its many forms of equipment and raw materials, and to labour in its varied forms. In general agricultural production the contributions of other factors are much greater than that of land.

The quality of a given area of land is determined by its input capacity under any given set of circumstances. In other words, the economic quality of land is determined by the quantities of other factors which may be associated with it, with a certainty of full return. The productivity of any given area of land is the ratio between input capacity and output capacity. When the physical input and output capacities of two areas of land are the same the economic productivity of one may be much higher than the other because of its better situation relative to markets and transport.

Both uses and yields of land are socially determined.

Present uses provide some guidance as to potential and future uses, but they are far from providing full guidance to either future uses or future yields under changing circumstances.

Any planner of land uses obviously ought to know the present uses of land, and recent or present yields in physical quantities and in cash values (of land with the other factors), but he also needs to have clear conceptions of social needs in the use of land in at least the near future, and some clear conceptions of probabilities of changes in economic and social conditions which may affect both its agricultural and non-agricultural uses.

Social needs are dominant, for man in society can adapt, increase and apply his capacities more or less according to recognition and acceptance of ideas of social need.

In considering social needs in regard to the distribution of land to different uses account must be taken of all the different needs. Each need should be given its place in a set of priorities resting on judgments of relative importance in relation to known present and expected near future conditions.

A few features of land uses stand out clearly :

- (1) Agriculture requires large extents of land, but different agricultural uses require varying extents of land, the

more intensive uses require (and cover) the lesser extents and the less intensive uses require (and cover) the larger extents :

- (2) Building and transport require (and cover) relatively small extents of land :
- (3) Future transport developments will be mainly along the existing transport routes—of roads, railways, canals, (unless there are large national schemes for new roads for motor transport which appear unlikely to materialise) :
- (4) Future building developments will be mainly in the vicinity of existing settlements of one size or another, and almost certainly on the chief of existing transport routes.

The major change likely to affect land uses which could be made would be that of planning entirely new transport routes and opening up new opportunities for relatively dense settlement (i.e. for urbanisation) in areas hitherto at a disadvantage for agricultural transport or for non-agricultural development. The planning and building of a considerable number of garden cities situated on the main transport routes now in existence, or marked extension and development of large villages and small towns which are already on or adjacent to these routes must, of course, make considerable changes in land uses, but in some ways these would be much less radical than those which would be caused by any shifting of main traffic routes. Developments in the vicinities of existing settlements and main transport routes will increase some agricultural advantages where they already exist. On the other hand, creation of new and important transport routes, with urbanisation at certain points on those routes, would not only create new agricultural opportunities, they would almost certainly withdraw existing advantages from certain areas.<sup>1</sup> The possible effects of creation of new urban groups (e.g. new garden cities) on existing transport routes are less easy to forecast. If the residential accommodation provided by these cities were no greater than will be required by the increased number of families after the war, this development would not withdraw advantages from any area but would merely check realisation of potential advantages. On the other hand, if new urban creation went to the extent of withdrawing population from some of the present urban areas it would withdraw agricultural advantages (as of special markets) and transfer them to new areas. The opinion may be hazarded that the former is more likely to be the position—that new urban development will provide for new

<sup>1</sup> That is, without increase in population. Such change with increase in population might not withdraw existing advantages.

families (i.e. an equivalent number of families), and will not actually diminish population in existing urban areas, except possibly in rare cases, and therefore will not shift agricultural advantages to any considerable extent. Nevertheless, agricultural advantages in special markets or potentialities of these will be redistributed to some extent with any creation of new urban areas or any extension and development of the smaller of existing urban areas.

In the absence of creation of new transport routes it is scarcely conceivable that any considerable urban development, or manufacturing with residential development, will occur on land which is agriculturally marginal or sub-marginal. If, however, this should occur it may be regarded as certain that any remaining portion of such land would not remain marginal or sub-marginal, but would be modified and developed for the agricultural service of the new population. Some of it, in fact, would be likely to be made highly productive.

In general, it is of great importance that the agricultural land of medium, good, and high quality lies largely along the more frequented of existing transport routes and in the vicinity of towns and the larger villages. It lies chiefly along the river valleys, along main roads and railways. This is not universally true, for areas like the Isle of Ely, the Holland Division of Lincolnshire, parts of Kent which are agriculturally highly productive, largely on advantages of soil and climatic conditions, show relatively little industrial or residential development. They carry relatively dense population because of the high productivity of their agricultural systems and the trades and industries directly connected therewith.

At the extremes, it would almost certainly be uneconomical for the nation (*a*) to create new transport facilities to make possible industrial and residential developments on land which is now agriculturally marginal or sub-marginal, (*b*) to take large areas of the agricultural land with the very highest present productivity for industrial and residential development. Fortunately, perhaps, (*b*) is unlikely to occur except in relation to small areas. If (*a*) occurs it will be because potentialities for building development are arising in such areas and not because of their present agricultural condition. Low values for agricultural purposes are very frequently associated with low potentialities for other purposes. While it may not be true that land of high capacity or promise for agricultural purposes will show high potentialities for non-agricultural purposes, it will certainly be true that land of medium agricultural quality associated with land with high potentialities for residential development will develop high capacities for agriculture (e.g. as for dairying,

market-gardening, poultry keeping) as soon as the associated land is developed for residential purposes.

Where land is to be used for housing development on the "dormitory town" system distance between residence and work-place will be an important factor in the choice of site. Accepting the idea that any new towns should be both work-places and living-places gives more freedom of choice of site. But in choosing a site for a new town with considerable housing on the open development or garden city principle, at least a moderate quality of land seems to be desirable even if not essential. The site must be one which will provide good foundations for buildings; it should be one which can be developed to make an attractive living-place; and in so far as private gardening is to be a part of the activities of residence there is need of as high quality of land for residences with gardens as there is for any line of agricultural production. Land which is submarginal does not appear likely to provide many attractive sites for garden cities. As far as physical conditions are concerned, land which can be successfully adapted to private gardening can be adapted to the commercial type. Land on which reasonably good gardens cannot be made is scarcely likely to provide attractive sites for towns.

From the previous considerations it appears that in the absence of creation of new transport routes, social need of land for non-agricultural purposes will mainly arise where the medium to good agricultural land is found, and probably more where the land is of good than of lower agricultural quality. If this forecast is correct, the choice of agricultural land for non-agricultural development will lie between the good and the less good, and not between the best and the worst. As far as transport is concerned, as long as development occurs along existing routes, it will take all sorts of agricultural land as they now exist along those routes, and on the whole it is likely to take more good than poor. In so far as there is an area of relatively productive land round all settlements of any appreciable size (say 2,000 population upwards but often also in the case of smaller settlements), and industrial and residential developments occur in the vicinities of these settlements, it will take up relatively productive agricultural land. And in so far as it is desirable that intensive forms of agriculture such as market-gardening and intensive dairying should develop in the vicinity of new or extended settlements it will be desirable that these should be established on relatively good land.

The dominant conditions in the distribution of land to agricultural and industrial and residential purposes are—

(a) That the latter purposes require relatively small areas of land,

- (b) That land used for these purposes shows vastly higher productivity in economic and social values than land used for the common run of agricultural purposes,
- (c) That any possibilities of developing productivity in agriculture to an extent approaching the productivity of land which can be used effectively for industrial or residential development will occur only on very limited areas and then mainly because of residential developments in the vicinity of such areas.

It is taken for granted here that the higher prices or rents (in the form of ground rents) paid for land for development purposes as compared with prices and rents paid for similar land for agricultural purposes represent true social valuations, and that these differences will remain very much (though perhaps not entirely) as they have been. To anticipate any other condition is to postulate very radical changes in the industrial and agricultural conditions in Great Britain which might involve a radical reduction of total population. It appears probable that only a radical reduction in total population could seriously affect the valuation of land for agricultural and for development purposes respectively. No change in ownership, e.g. nationalisation, could seriously change the social need of land for one purpose or another, though it might make considerable differences in the choice and allocations of land for different purposes.

The area of land required for non-agricultural development will depend on (a) the need and the economic possibilities of such development, (b) the plans for settlement and utilisation under industrial and residential development. There can scarcely be any doubt about the need for an extension of the process of non-agricultural development after the war. There may be equal or even greater need of agricultural development. In that case, both sets of needs have to be met and allocations for each must affect those for the other. But no changes can be foreseen which would enable agriculture to compete with building, in an open market or on equal terms, for land suitable for both purposes.

Allocations of land for different purposes will depend very largely on the form of ownership and control of use. Unified ownership and control is essential to the effective planning of any given area for building, transport, recreational and agricultural uses. While some restrictions on uses of land may be imposed by social control under general planning, it is much more difficult to secure positive development for specific purposes by existing methods of general social control. Allocations of land for specific purposes which are not in accordance with those which would occur under free competition necessarily shift values from one area to another and often from one owner to another. It

may be possible to provide measures of compensation for owners suffering diminution of the economic potentialities of their land, but it will be more difficult to withdraw from the favoured owners any considerable part of the value which specific allocations for positive development may create for them. One very practical aspect of this position is that if restrictions on use are put on present agricultural land which is highly suitable for both agricultural and non-agricultural purposes, compensation should be provided for the agricultural owner.

Ideally, any system of general planning by social control which may reduce values of some areas and increase values of others should be accompanied by a system of special assessment of favoured areas and compensation for the areas suffering restriction, whereby the former will provide compensation for the latter. The net effect of such a system would still be that of raising land values by the difference between the agricultural and the development value, but the difference would be more widely distributed. There are, however, almost insuperable difficulties in working any system of this kind. There cannot be fully effective planning of a positive character without unified ownership and control of areas for which plans are to be made.

As development for non-agricultural purposes will occur almost-wholly on land now used for agricultural purposes the main considerations in planned allocations appear to be :

- (1) What types of land are suitable for building—residential, commercial and industrial ?
- (2) What types of land are suited to recreational purposes of different sorts (public gardens, recreation grounds, parks, golf courses) within appropriate distance relationships to residential development for each such sort ?
- (3) What types of land are suited to development of the more intensive types of agricultural production which should be associated with building and especially residential development ?<sup>1</sup>
- (4) What would be the increase in cost in using relatively unsuitable land for building while setting aside relatively suitable building land for other and especially agricultural purposes ?
- (5) What would be the increase in cost in using relatively unsuitable land for recreational purposes while setting aside more suitable land for other purposes ?
- (6) What would be the increase in cost in using relatively unsuitable land for the higher agricultural production

<sup>1</sup> The order given here in (1), (2) and (3) is more or less that of economic value, and no other priority is implied.



while setting aside the more suitable land for other and especially building purposes ?

Considerations, and wherever possible close estimates, of social costs and expected social returns should determine the allocation of land for different purposes. While it is recognised that close estimates of social returns may be difficult to make because in some forms they are more or less intangible<sup>1</sup> without some estimates of these effective practical planning will not be undertaken.<sup>2</sup>

There seems to be a common assumption that when development of land occurs for building and recreational purposes, and land is taken from agriculture, no other developments will occur. Yet experience shows that wherever considerable residential developments occur agricultural developments nearly always follow them. Local increases in population give rise to new opportunities for agricultural enterprises of one sort and another. Agricultural land and farms previously at relative disadvantage gain advantage and on the whole the occupiers are not slow to use their opportunities. When land of high rental and capital values for agricultural purposes is taken for residential purposes other adjacent land increases in rental and capital values. It may be that this process is slower than is socially desirable and consequently that planning and development of other land for certain agricultural purposes should be undertaken concurrently with any considerable planning and development for residential purposes, but this again implies unified ownership and control. With the necessary powers of control such planning for agricultural development might be undertaken, for it would present little more difficulty than planning for general urban development—except that up to the present time less thought has been given to it.

<sup>1</sup> Nevertheless they are more or less valued, and certainly paid for, in sales and purchases of land.

<sup>2</sup> In considering relative productivities of land in agricultural and non-agricultural uses, and values for those uses, it is unnecessary to remember that agricultural production often, though not universally, continues for much longer periods than other forms. Some, perhaps nearly all, residential development is for long-term use, and may be described as permanent, for though one class of building disappears another follows it. But up and down the country there is much obsolescence of factory and other industrial sites. They are not only no longer productive ; they are unsightly, and often nuisances. In the case of quarrying, particularly for ironstone, there is waste of surface through lack of planning and refusal to meet the cost of reinstatement. In some cases of mining, previous planning and social control would save land for agricultural uses. The general question of control of industrial uses of land to protect amenities and to remove causes or alleviate results of obsolescence needs more consideration than appears to have been given to it.

Some developments of transport, particularly railways, and occasionally building developments, have seriously disturbed systems of local drainage and thus caused deterioration of agricultural land. Future planning for these purposes should avoid this result.

On the questions of relative costs raised above there appears to be very little information. But it is suggested that the costs of developing relatively unsuitable land for certain agricultural purposes would be far less than those of developing relatively unsuitable land for building purposes, though somewhat different considerations may apply in the comparative cases of development for agricultural and development for recreational purposes. In the cases of land for children's playgrounds, general recreation grounds and public gardens, relationships of distance between blocks of residences and areas set aside for these purposes will be of extreme importance. Accessibility and probable frequency of use have to be taken into account with costs of development. In the cases of public parks, golf courses and some special recreation grounds, distance from residential blocks is of far less importance. Indeed, it may be suggested that for some public gardens and parks land of second-rate agricultural value, or difficult to develop for intensive agricultural purposes, would be preferable to flat, gently sloping, or relatively good land which could be developed agriculturally. Broken contours and variety of scene and herbage would seem desirable in many large public gardens and public parks.<sup>1</sup>

In the case of large agglomerations of population like that of "London", a green belt, with farms, may be both desirable and practical. Some effects of the green belt may be those of giving highly developed transport and shopping centres to separated parts, especially those lying away from the common centre, beyond the green belt, and of giving the population of these parts a greater sense of local community. With smaller settlements the inclusion of farms, or even large market-gardens, inside the settlement itself gives rise to many difficulties. The conditions are not entirely conducive to successful pursuit of agriculture or large-scale horticulture. Cutting up the built-up area with agricultural holdings, as well as the necessary open spaces for recreation, increases the time and money cost of transport, and increases costs of other services such as gas, electricity and water supply.<sup>2</sup> On the whole it appears desirable

<sup>1</sup> With development of facilities for travel, national and local, there should be use of some marginal and sub-marginal agricultural land as public parks, but this is a separate subject.

<sup>2</sup> This also applies to other large open spaces. But it would be absurd to have, say, a square mile of farms inside an otherwise integrated and fully organised settlement of 100,000 persons. It would be equally absurd to divide two parts of what might be one community, of 5,000 persons each, with a mile or two of farm land merely to save a degree of quality in the total farm land. Here much depends on the size of settlement to be adopted. Probably no one would want anything in the nature of green belt or block, except for recreational purposes, inside the settlement of a community of 50,000 persons. Between fifty and one hundred thousand there may be differences of opinion. Over 100,000 there are good reasons for breaking up urban-

that the immediate agricultural services such as the supply of milk, fresh vegetables, and eggs, should be rendered from the vicinities of new settlements, as hitherto, rather than from specially allocated areas inside them.

It is difficult to go much farther than this with general suggestions regarding selection of land for agricultural and other purposes, and for agricultural developments in relation to new settlements. The practical problems would be much better considered in concrete cases—with reference to given areas. It may be that a town destined for development would have land in two directions equally suited for building and associated developments, but better for agriculture on one side than the other. In such a case the poorer agricultural area would obviously be selected for building under any system of practical social planning. In any other case, estimates of social cost of building and associated development, and of necessary agricultural development, with estimates of social returns, should be made, and decisions taken on the best possible estimates for the particular case. In many cases it may be found that the lower costs and the higher relative returns will be secured by taking the more suitable land for building and associated development and using any necessary part of the savings for agricultural development, than by saving the best agricultural land which is also the best building land, and pressing building development on to less suitable land.

In spite of what has been written above it must be said that there has been considerable waste of land, and of good agricultural land, in building developments since 1918. Unless the private spaces are well used there may be much waste of land, and there seems to be much waste of time in travel, with some in costs of transport, in providing houses for large populations at the rates of 8, 10, or 12 to the acre. In future planning considerations should be given to economy in use of land :

- (1) by associating large blocks of flats with detached or semi-detached houses ;
- (2) by associating allotment garden areas, to be rented by those who actively desire gardens, with blocks of flats and streets of houses ;
- (3) where detached or semi-detached houses are provided, by detaching some of the garden areas between the backs

isolation, given (1) that parts broken off can be made into vital communities, (2) that the green belt is sufficiently deep to really divide communities and to provide for the practical, unhindered, pursuit of agriculture. The condition of a farm entirely surrounded by town streets is miserable. But in the practical consideration of treatment of agricultural lands in planning much depends on the size of the communities to be planned and on the relations of development sites to existing communities and transport routes, or to new transport routes.

of houses from individual houses and treating them partly as communal children's playgrounds, and partly as allotment-gardens to be let to those who desire them.

These are more or less casual suggestions, but it is obvious that we have not yet reached the limits of effective planning to provide necessary general space in building development, and specific "open spaces", combined with the optimum possible economy in use of land.

As regards the reduction of agricultural land, and agricultural productivity, in future building development, attention should be directed quite as much to possibilities or positive development of relatively undeveloped agricultural land in the vicinities of new settlements or those to be extended as to more negative planning by restriction on use for other purposes of agricultural land now regarded as good or highly productive. It is along the lines of some possible restriction on other uses and many other positive developments of agricultural land that maximum utility in use of land for all social needs is likely to be reached.

If the principle of restriction of use of the best or good agricultural land to agricultural uses is to be followed there are three very practical questions which appear to deserve answers—will agricultural owners be compensated for loss of potential (sometimes near-by) values of land for other purposes: alternatively, is ownership of such land to be transferred to public authorities, and in that case what will be the basis of valuation for transfer: how long is such land likely to remain in agricultural use as patches breaking-up small and medium-sized settlements, causing increases in time and cost of travel, possibly reducing transport services, and increasing the costs of services such as electricity, gas and water, when the community realises these conditions?

Positive plans for new "urban" developments, residential or primarily industrial with associated building for residential purposes, might be accompanied by plans for the agricultural development of the surrounding area—choice of land for market-gardening, dairying, or other relatively intensive systems, with plans for laying-out, draining and equipping it for new or more intensive forms of production.

# THE PLANNING OF BRITISH AGRICULTURAL POLICY FOR POST-WAR CONDITIONS, WITH SPECIAL REFERENCE TO LAND ADMINISTRATION

by

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## I—GENERAL

### *(A) The Need for the Immediate Consideration of the Future Development of Agricultural Policy.*

THOSE concerned with agricultural policy and planning are so much immersed in the demands of the war-time situation at the present time that it would appear at first sight that little useful purpose could be served now by contemplating the planning of British agricultural policy to meet the post-war situation. It might be supposed, further, that conditions in the two periods would be so essentially dissimilar that the factors which apply to either would afford little help in the other. To separate the two periods for consideration, or, more probable in present circumstances, to consider war-time problems and conditions to the exclusion of those in the post-war period of reconstruction, would, however, be a mistake. The changes which are occurring under the stress of war conditions will themselves profoundly affect the post-war situation. Many of these changes will persist in their effects, and will thus determine or limit developments in post-war conditions. Indeed, if the war becomes a long-drawn-out struggle of endurance and attrition, the division between war and post-war conditions is likely to diminish or tend to disappear, owing to the profound general social changes which will occur, and which would probably in many cases be irreversible. Obviously, the longer the war continues, and the greater the adaptation there is to meet its demands, both in our social structure, in the flow of overseas trade, and in our agricultural technique, the less freedom of choice will remain after the war in regard to a "permanent" agricultural and food policy. War-time changes, when considered and introduced, must therefore be viewed to some extent with this fact in view.

We need not, however, suppose that the effects of the war on agriculture will all be adverse, requiring painful reversal afterwards. The adjustments which are occurring *during* the war

are likely to include changes in organisation and technique which will themselves persist, or which should be made to persist. Thus, vital as the need for further great and revolutionary changes in agricultural policy and practice after the war will be, the first stage in our task of reconstruction will be to conserve and consolidate the improvements which are now being introduced under the stress of war conditions. This will require decision during the war with a view to the immediate post-war application of the necessary measures.

This applies, for example, to the introduction of new implements and fresh technique of cultivation; it applies also to the measures adapted to raise the average level of performance to that previously attained by the best practice. As regards the former, the American Civil War saw the triumph of the combine harvester on the prairies of the West, and the last Great War was responsible for the introduction of tractors in an appreciable number in this country. If our research and advisory centres and services are functioning as they should be at this time of supreme emergency, fresh improvements, some of which will become of lasting importance when tried in the field, must now be in course of initiation. Concerning the latter point, to take only one example, the need for increased self-sufficiency on farms as regards animal feeding-stuffs has led to the ploughing up and re-seeding of grassland, which may effect a lasting improvement in our pastures, along lines which have been urged by Sir George Stapledon and others for some time. It will be wasteful for farmers to receive plentiful credit to obtain adequate equipment and raw materials to produce their war-time harvests, if, directly the immediate emergency has subsided, these benefits, which have enabled them to attain a standard of farming which previously they had not reached, are abruptly withdrawn. Again, the natural tendency will be for many farmers, once the tension has relaxed, to regress from the higher level of efficiency and performance which they are now, voluntarily or under pressure, beginning to attain. Vast improvements in performance and efficiency will probably occur before the war is over, and it is important that these, together with the greater mental alertness and adaptability which they will foster in farmers, should not be lost when the period of reconstruction comes to be faced.

There is little doubt but that we have entered upon a new era in our national economy, and British agriculture cannot escape the effects of the many political and economic changes that are taking place with almost lightning speed. The choice is therefore, either :

- (1) To wait and see what the repercussions will be upon

- agriculture, and to let events take their course unrestricted by any conscious effort,
- or (2) To anticipate some of the major changes, and to make plans for strengthening the structure of the industry so that it will be better able to withstand any serious blows at its economic position, while at the same time putting it into a position to contribute its maximum effort to the common good.

*(B) The Bases of Post-War Planning.*

Probably at no time in our history has the situation been so urgent, nor could a more suitable opportunity present itself whereby changes can be made towards improving the position of agriculture. The present exigencies of the war have forced us to focus our attention on the production of food at home, and hence to study the potential output of food from our own soils. Much of the work that has been undertaken to meet the present emergencies can become a permanent feature of the industry if plans are made now to fit it into any peace-time economy. There are many factors which are unpredictable arising out of the war; and which make the best forecasts or plans rather hazardous, but of one thing there can be little doubt, much greater attention will have to be paid to all of our own natural resources, and especially agriculture, than was the case in the pre-war era, when we still held much capital outside of these islands, and when international trade, although restricted, did flow reasonably freely. The greatly reduced interest from our foreign investments, and the possibly limited overseas markets for our industrial goods will automatically force us to make the best use of our agricultural resources.

Thus the only sound basis for prediction regarding the effect of post-war political conditions upon agricultural policy is surely that there is little prospect of the country affording any measure of support for agriculture based solely upon the interests of the farming community. As Sir Daniel Hall has said:

What the country is concerned about is not so much to put this or that farmer on his legs as to reshape the conditions of the industry whereby the land shall be more efficiently utilised and contribute more largely to the income of the country.<sup>1</sup>

This does not necessarily mean the indefinite continuation of the present war policy of maximum production irrespective of cost. On the contrary, it will mean the careful husbanding of all our resources, and therefore an increasing emphasis on

<sup>1</sup> *Countryman*, January 1939, p. 539.

*efficiency of production.* Defence considerations, of particular importance in the case of agriculture, will have to be given weight for a period at least, although it is to be hoped that this will not be lengthy. But the steps necessary to meet these need not infringe very seriously on the policy of creating an efficient agricultural industry which will give the maximum contribution to the general welfare. In other words, the primary aim of agriculture will be to maintain the highest possible standard of living for the people of these islands; this will include meeting the requirements not only of those engaged on the land, but equally of those engaged in industry and commerce. This fundamental point should be borne in mind, as it is so easy to make the mistake of dealing with any one of our major industries in isolation, and to make plans accordingly without reference to the effect which these may have on the general good.

For the past hundred years or so agriculture has suffered from the fact that it has not been considered seriously as one of our important industries, and this is possibly why no policy, apart from what may be called an opportunist one, has been laid down for its guidance and proper maintenance during this period. It has also given rise, as has already been indicated, to the emphasis on non-economic factors, to the detriment or exclusion of the criterion of business efficiency.

The peculiar conditions of agriculture make the necessity of a long-term policy even more important possibly than it is in the case of any other major industry, as the results of any action taken now will persist for a comparatively long time. In this country, owing to our industrial and international financial strength we have allowed the land to be used as the owner or tenant thought fit, with very few restrictions, with results with which we are now suddenly confronted. This may not have been so very serious under previous circumstances, although land which has been taken for building purposes, often in a most purposeless and unplanned way, has been lost to agriculture for good and all; but now and in future the best use of the limited soil of this country requires the most careful study. On the one hand, we cannot afford to let the fertility of our farm-lands become reduced through wrong or undercropping; on the other hand, we should not continue the cultivation of marginal land, and in our haste to increase the area under the plough, precipitately ascend the mountain sides without stopping to consider very carefully the heavy effort and scanty returns that would result from attempting to bring into cultivation these marginal hillside areas.

The planning of agricultural policy after the war, if it is to have any real chance of acceptance or lasting influence upon



events, cannot be based, any more than it has in the past, upon broad principles untempered by the facts of the existing situation. Thus proposals for future policy need to start from a realistic appraisal of probable post-war political, social, economic and technical conditions and tendencies. That is, they must take account of the practicable possibilities. Before they take shape, they must therefore wait, to some extent upon the issue of present events.

In considering the question, then, of what policy should be adopted, it is necessary to take into account, among other factors, the state of the political situation at the conclusion of the war.

At the outset, of course, we must presuppose an Allied victory, or at the very least avoidance of defeat, in the military field. This is axiomatic, because conquest would deprive us of freedom of political and economic action, and consequently of the need for or power to formulate policy.

In planning probable trends of British agriculture after the war, it is necessary to consider successively four distinct main problems. These are :

- (1) Upon what guiding political principles will the national economic policy be based ?
- (2) What national economic policy will be adopted, taking into account present tendencies and ideas ?
- (3) Given the national economic policy likely to be adopted, what place will it provide for home agriculture in the scheme of national economy ?
- (4) Given the place of agriculture in the national economy, what measures of reorganisation will be required to enable it to fulfil its part successfully ?

(1) *Upon what guiding political principles will the national economic policy be based ?*

We must have, first, a guiding principle which will determine international political relations in the short-term post-war period, in order to know whether the national economic policy will be designed to support military strength, by maintaining preparedness in the economic field, or, on the contrary, to aim at a general raising of the standard of life of all nations with which we are in economic relations, through the freer interchange of goods and services.

- (a) Will the policy be dictated, or appreciably affected, by a desire to foster national self-sufficiency, as an essential element in national defence ? If such should be the case, we may have to contemplate a situation in which we are led to the adoption of a restrictive and autarchic policy, not necessarily through the persistence of hatred

towards our present enemy, but through fear or continued mistrust. We may thus pursue a precautionary policy based primarily on the desire to maintain our own military preparedness and security, in order to be in a position to forestall and to deter a further outbreak of hostilities.

- (b) On the other hand, if a system of international order were to be generally recognised and accepted, and the people of Germany could be reconciled to it and would enter freely into a European concert of nations, it would permit the pursuit of a policy by this country, in company with others, consciously directed towards a general raising of the standard of living of the populations of all countries.

Thus the forms of international political co-operation, if any, which emerge after the present conflict will condition to a considerable degree the extent to which economic co-operation between countries can be fostered for their mutual good. Obviously, if a League of Nations could be revitalised, or if some form of Federal Union came into being, not only *might* there be a more favourable atmosphere in which mutual trust could develop, but the channels and machinery for international economic co-operation on an increasing and widening scale would lie ready to hand.

Thus economic policy is largely subsidiary to, and conditioned by, political policy and conditions.

(2) *What national economic policy will be adopted?*

What national economic policy will be sought? Is there likely to be a drive towards:

- (a) Complete domestic self-sufficiency?
- (b) Greater interchange between Empire countries?
- (c) Development of bilateral international trade (i.e. trade between complementary countries)?

or (d) Full freedom of international trade, or, at least, much freer international trade?

If we aim primarily at maintaining military preparedness, there is likely to be a drive towards either (a) or (b), or a combination of both. If, however, we intend to follow a policy of international co-operation, we should concentrate upon (d) as our ultimate objective, with (c) perhaps as a practicable first step.

The social and economic conditions which are issuing from the war will powerfully affect post-war economic policy. The following are some of the problems which will have to be considered and allowed for in formulating such policy:

- (i) Will the enemy occupation of countries which have formerly

been among our best suppliers, such as Denmark and the Netherlands, impair their capacity to supply again the British market? The general dislocation of life in these territories, together with the systematic economic "looting" of their resources by the German authorities, will diminish their store of capital; the shortage of animal feeding-stuffs, consequent upon the cessation of importing from overseas, will lead in the immediate future to the widespread slaughter of breeding-stock, if it has not already done so; machinery and implements will deteriorate without renewal or replacement, or will be taken as scrap metal to feed the German war machine. Lack of artificial manures, especially phosphates, will leave its mark on the productivity of the soil. Even supposing that the other world-powers will be in a position to make international loans to succour and resuscitate these countries after the war, the rate of replacement of the different forms of capital will vary considerably; for example, artificial manures will be available fairly quickly, and implements will be easier to replace than breeding-stock.

- (ii) What will be the effect of the stimulation of production in Empire and other countries still open to supply us? The increased supplies being drawn from the Empire and from other countries overseas is greatly stimulating agricultural production in those regions.
- (iii) Will home agriculture be permanently diverted in forms of production, and improved in productive capacity, by the present stimulus?

The solution to the problem of post-war redundant resources in agriculture cannot be found simply in allowing a larger share of the domestic market to be retained either for home production, or in favour of the Empire and other overseas countries which are now expanding their production for our sake, at the expense of those European countries which are normally dependent for their prosperity upon international trade in agricultural products, and which have fashioned their agricultural economy upon that dependence; for it will surely be a mockery if, having fought to free these countries from enemy occupation, at the conclusion of the war we simply leave them to languish economically, through the loss of their former market in the United Kingdom. There is here a very real problem, involving a sharp conflict of national interest. Note only one indication:

Australia's most effective agricultural contribution to the war effort has been formulated by a conference of State Ministers of

Agriculture. Intensive production was urged to supply the United Kingdom's requirements, especially of butter, cheese, dried and condensed milk, eggs, and probably also pig meat. . . . The conference considered that butter production could be increased by 30% during the next three years, and *assumed that the countries making good the shortage in the United Kingdom market caused by the elimination of Denmark and Holland would retain the trade after the war.*<sup>1</sup>

(3) *Given the national economic policy likely to be adopted, what place will it provide for home agriculture in the scheme of national economy?*

If we decide to follow a policy of complete self-sufficiency on defence grounds, our task is relatively simple, in aim if not in achievement. We shall commit ourselves to pursuing in peacetime an intensification of our war-time food-production programme, as far as our means and resources allow.

If, however, we are aiming chiefly at raising the standard of living of the whole community, we shall have to consider what forms of agricultural production can be undertaken most advantageously in this country, that is, those in which we possess the greatest comparative advantage.

These national economic policies, if they are to be enduring, must take account of technical as well as political facts. For example, the adoption of a policy of complete self-sufficiency, advocated on defence grounds, would be futile as the agricultural conditions of this country, chiefly through limited area of productive soil, render it inherently unattainable.

The same applies to agricultural labour. It is possible that there may be a post-war revival of the demand for a "Back to the Land" movement, to re-absorb men released from the Services and other war activities. Discussions on the merits of a "Back to the Land" policy usually start from one of two standpoints:

(a) It is advocated by those interested in maintaining the agricultural population at the maximum, without consideration of whether the surplus labour-force which is leaving the land might not be more profitably employed in other forms of productive activity.

(b) It is also supported by those who, seeing the large mass of unemployment which has existed in this country continuously since the last war, propose that the surplus of labour should be put to work on the land, quite apart from the aptitude of these men for such skilled work, or of the effects upon agricultural production and standards of living which would result.

<sup>1</sup> *Times Trade and Engineering*, September 1940, p. 12.

Such a question requires to be considered scientifically, that is, the demands of agriculture for labour at the required level and intensity of production should first be determined, and then it should be considered whether any surplus of agricultural labour over and above this sum could not be utilised more efficiently elsewhere.

In the past there has been much confusion of thought as regards the part which agriculture should be expected to play in solving the unemployment problem, and as a consequence tragic results have to be recorded. It is generally conceded that in the main the attempts which have been made since the last war to settle men on the land as a means of reducing the incidence of unemployment have been a failure. The comparatively few absorbed and the small number of successful enterprises have been sadly disproportionate to the economic damage done to the industry as a whole. The results could scarcely have been otherwise, as apart from the initial capital advanced to those thus introduced into the industry, it simply meant that a larger number of people had to be supported from the general agricultural income, as little or no increase in productive income followed the increase of the numbers of land workers. It is one thing to make use of a certain part of our land area to improve the lot of our unfortunate unemployed, but it is quite another if those so settled on the land become part and parcel of the commercial industry. In any attempt to plan the use of our land resources the two distinct functions of *commercial agriculture* and *unemployment amelioration*, the one an economic and the other a social objective, should be dealt with separately. In fact, this attitude should be adopted when surveying the present agricultural position, as it is quite clear that a considerable proportion of our farm units are marginal, in the sense of contributing little to the common fund of consumption goods, and they only maintain a rather poor living for the occupants. The same consideration should be given to those cases as that suggested for the unemployed from other industries, whom the Government may decide should be taken care of on the land.

These are only two questions among many. In all cases, such partial views must be merged in a more comprehensive outlook, one which bears all the factors in mind in their right place and due proportion.

In brief, we must decide what we are going to do with the land, what use we want to make of our available labour, or capital, or managerial skill, *what we want them to do for us*, rather than to decide *to do something* for the land, for the unemployed, etc. irrespective of its repercussions on the individuals

concerned, the welfare of the industry, and ultimately the common good.<sup>1</sup>

Will the necessary changes imply a further development, or a reversal, of the tendencies of agricultural production which have been operating in this country of late years, characterised by a considerable degree of concentration upon specialised forms of production, such as dairy products, poultry and eggs, fruit and vegetables, etc. Taking a long-term view, it is possible that, with the exhaustion of virgin lands, the costs of agricultural production overseas might rise sufficiently to enable this country to come within sight of competing economically in respect of crops which cannot now be grown advantageously here. In such an event, would egg production and poultry raising, or, again, pig-farming, continue to form specialised industries, as they have become increasingly, or would they again predominantly constitute items in systems of more general farming?

Changes in production both affect, and follow, consumption trends. Agricultural production will have to be conditioned by the results of recent advances in the science of nutrition, and recent investigations of the extent of under-nourishment and malnutrition. In other words, it will have to be realised :

- (a) That modern knowledge of dietetics has wrought changes in the traditional diet, and that, as a knowledge of these becomes general among consumers, so the prevailing diet is likely to be modified.
- (b) That it is becoming increasingly evident that mal-nutrition and under-nutrition exist among a larger proportion of the community than has hitherto been suspected, and that increasingly vigorous and more comprehensive steps will have to be undertaken to combat these.

The influence of these two factors will have great repercussions upon the consumers' demand for different types and qualities of foodstuffs.

As regards a nutrition policy, the position is steadily becoming better. The "marriage of health and agriculture" has become more widely discussed (and, one hopes, thought of) during recent years, and estimates of the increased supplies of food required to feed all the population on an adequate basis are being considered more and more in relation to the effects which this would have upon the size and character of agricultural production. It is perhaps significant in this connection that Sir John Orr, who has been unresting in putting the facts of the situation and the need for action before the public, combines

<sup>1</sup> Land schemes for unemployed and returned soldiers have not met with the success which their sponsors had hoped for because fundamentally such plans are unsound.

both the health and the agricultural outlooks, in that he is a medical man who is the head of a well-known agricultural research institute.

Consumption trends will depend upon economic as well as dietetic factors, two being :

(a) With the rising standard of living in recent years, a greater proportion of the family income has been devoted to expenditure other than on foodstuffs. Will this tendency continue ?

(b) Under the greater financial stringency of the times, is the rising standard of demand for quality and variety in foodstuffs likely to be maintained ?

What advantages do we wish to assure to the various members of the agricultural partnership ? Can we say that the following affords a fair summary of some at least ?

(1) For the landowner—a regular, if moderate return on the capital, so that the permanent equipment of agriculture will be maintained at a proper level.

(2) To the farmer—a satisfactory living, which will stimulate him to use his utmost endeavours to run his holding in the most efficient manner.

(3) To the worker—conditions of work and a wage which will afford a standard of living comparable to that of the urban worker of a similar degree of skill, including prospects of advancement, the possibility of the progressive improvement of the amenities of rural life by the extension of social services and other public utilities, such as housing, light, power, transport, etc., so that an adequate and efficient labour-force will be ensured for carrying on the industry.

It is not necessary here to deal exhaustively with all the factors which should be borne in mind while formulating at this stage a post-war policy for agriculture, but those that have been indicated are likely to have their most profound effect on the situation in the post-war period.

(4) *Given the place of agriculture in the national economy, what measures of reorganisation will be required to enable it to fulfil its part successfully ?*

As a natural consequence there have to be considered the measures of reorganisation required to enable agriculture to fulfil its designated part in the national economy.

The forms of organisation suggested are not likely to be strikingly novel or entirely original. Very little can be visualised that has not already been discussed, say since the opening of the century. Our task at present is rather to reconsider the various proposals for agricultural reorganisation which have been made, and sometimes put into effect, during recent years,

to examine how far they must be modified in the light of the altered circumstances arising during the war and those likely to obtain in the immediate post-war period, and to judge how far these altered circumstances may have strengthened the arguments for or against them.

## II—THE USE, OWNERSHIP, AND MANAGEMENT OF AGRICULTURAL LAND

The problem of the agricultural use of land involves consideration of its :

- (a) Control as regards its distribution among alternative uses.
- (b) Ownership, and the management of the units of ownership.
- (c) Operation and its management in farming units.

We may now consider these more particularly, especially in relation to the need for reorganisation to achieve greater efficiency, and the various proposals which have been put forward.

During the last ten years reorganisation in agricultural marketing has proceeded apace. Whether the measures adopted were advisable, or have proved successful, does not matter for the moment. What must be emphasised is that a measure of marketing reform has been attempted, whereas in land utilisation and in agricultural production long-term reorganisation has lagged behind.

The place which is assigned to agriculture in the national economic policy will vitally affect, and may absolutely require changes in, the form of the ownership, management, and farming of agricultural land.

All these problems should be regarded from the industrial standpoint. Thus the control of land, the size and lay-out of the units of land ownership and farm management, and the investment of permanent and semi-permanent capital, should all be freed as far as possible from the influence of personal circumstances or private caprice due to non-agricultural factors. What does this involve ?

### (a) *Control of Use.*

- (i) Agriculture is only one aspect of the problem of the land, even of rural land, and therefore the desirability of the best allocation of land among all its uses must never be lost sight of. This principle leads us to the proposition that any reform of land ownership and management, if it is to be far-reaching and adequate, requires the establishment of some form of national land-planning organisation, to supervise and control the allocation of land among its alternative uses. The unplanned invasion of good class farmland by demands for urban needs must be met, but claims should be referred to this impartial



authority, which would be competent to give an unbiased judgment between the competing claims of housing, industry and agriculture. Its decisions must be based upon comprehensive economic and soil surveys of land resources, and while encouraging changes in land utilisation which are justified from time to time by changes in comparative costs, should endeavour to prevent unco-ordinated action, such as the utilisation of good farming land for factory or housing sites, when poorer land might be equally suitable for the purpose.

- (ii) Planning alone, on the lines of the existing regional and town planning schemes, is largely negative. The decision that certain areas are best suited, and should be reserved, for agricultural, industrial, or residential purposes gives no guarantee that the land will be employed in this way if adequate capital is not forthcoming or if other obstacles intervene. That is, planning, to be effective, requires not only central control of, but also central encouragement of development.

These two principles suggest that land is a national asset, which should be treated on broad lines from the social point of view, that is, a balance should be maintained between the opposing claims of agriculture and of other demands for housing, recreation, etc. and that land should be consciously directed into particular uses, according to its suitability and the urgency of the competing demands.

The problem of the control of land use is well worth study, even during the war, and not only because of its importance to agriculture, but also because of the opportunity for concerted planning and action now afforded. The increased attention recently given to the problem of controlling the geographical location of *industry* gives hope that this may issue in action after the war, and that a situation may occur in which the problems of town and country planning will be tackled in a comprehensive and resolute fashion, and this would include the question of the utilisation of land for *agricultural* purposes. Indeed, if the planning of the territorial decentralisation of *industry* is to be tackled, the necessity of safeguarding the land required and best fitted for *agricultural* production requires that close attention should be immediately given to this problem from the agricultural side.

(b) *Ownership and Operation.*

- (i) Shall we continue to rely, practically the only country in Europe in this respect, on our traditional and still predominant system of ownership in large private estates ?

Even if such a form has had substantial merits, which few competent observers would deny, can such estates continue to exist in their present form in adequate numbers, owing to the increasing difficulty for many landowners of "making ends meet", and the consequent inducement to them to realise the capital value of their estates, by selling out (prior to the outbreak of war, at least) for "development" purposes?

If such customary form is departed from, what is likely to replace it?

(ii) Should there be an increasing tendency towards occupying ownership? The War of 1914-18 gave a great impetus to this, but the occurrence of the trend was quite apart from any question of its desirability from the point of view of sound and efficient organisation, for the movement was largely involuntary on the part of the farmers themselves, who in most cases neither sought nor desired the ownership of their farms. What will be the effect of the present conflict? Are the economic conditions which gave rise to the tendency then again in operation to-day?

This is the "natural" alternative to (i) in the sense that it can come about under the pressure of changing price-levels and money-values, without active planning or conscious approval by the State. For that reason it is all the more necessary to foresee the operation of the tendency, should it exist, in order that it may be forestalled if considered economically or socially harmful to the national interest.

(iii) Shall we see a tendency towards the development in this country of some form of corporate ownership, by land companies? These would be formed with subscribed capital, to acquire blocks of agricultural land, conveniently situated and suitably-sized. Their function might be comprehensive. It could include not merely the ownership of their estates, in the manner of a holding company; nor would it be limited, as under the present landlord-and-tenant system, to providing the fixed capital required by the farmer; but it might well extend to active participation in the work of agricultural production, by providing a number of other facilities, as well, if the individual units were large enough, in the way of "public utilities" (water, lighting, power, etc.), transport, purchasing and marketing facilities, and possibly research, advisory and management services. In some of these respects such concerns would be the rural counterpart of the trading estates which have developed in various parts of the country during recent years.

(iv) The other alternative is nationalisation of the land, with State ownership, regional management, and private tenancy and operation of farms.

The possibility of any such deliberate change in organisation

as that involved in (iii), being carried into effect is obviously dependent upon technical as well as financial considerations. What is likely to be the economic condition of the country at the conclusion of the war? Will capital be available to finance the required changes, or will it be scarce, either permanently or for an appreciable period, through the occurrence of the war? What position will agriculture occupy in the priority of claims to finance reconstruction? Thus much would depend upon the length and duration of the conflict.

There are three standards of judgment which I wish to apply here in considering whether our agricultural land, as owned and operated at present, is organised in the most efficient way. These are: (a) Are the scale and lay-out of our units of land management and farm operation on the whole the best attainable? (b) Are our landed estates and individual farms capitalised at the optimum level of investment, i.e. adequately but not wastefully? (c) Is the average level of professional knowledge and practical competence among landowners, their agents and managers, and farmers, as high as it might be?

(a) It is necessary to ensure that the size and lay-out of the *units of ownership*, be they estates or single farms, are suitable. It is needless to argue the point that in a great many cases the units of agricultural land management in this country are not of the right size, and that their lay-out and permanent equipment is badly planned. In the majority of cases where the size is wrong, it is too small. There are a variety of causes for this. Many estates have been broken up or reduced in size by the selling of farms and woodlands piecemeal, through general poverty, or a shortage of cash caused by the incidence of Death Duties. Piecemeal selling may also occur when portions of estates are sold at a tempting price for "development" purposes, the result being that the land is almost certain to be permanently lost to agriculture. Also where, upon the sale of an estate in lots, farms pass into the hands of their occupiers, there is a reduction in the unit of size of land ownership and management, although the unit of farm management and operation is unaltered. Then again, there has been of late years the tendency towards the multiplication of small-holdings, which has made the County Councils the largest landowners in the country. The creation of small farm-holdings need not mean that the unit of their ownership and management is necessarily small, but in practice the tendency is for this to be so, either because the local demand for such holdings is limited, or because it is difficult to obtain sufficient land in the district for it to be large.

The same applies, to an even greater extent, in the case of the size of *farm holdings*. It does not require any further study of

the situation to prove that a large proportion of the 400,000 or so holdings in this country fall below the minimum not to mention the optimum size for the economic use of up-to-date technique in production. All the more recent economic surveys of farming go to prove this, and at the same time they emphasise its wastefulness, for they show that the amount of capital per acre invested in equipment and permanent fixtures is greater in proportion as the units tend to decrease in size. Paradoxically enough, as things are at present these smaller units while being over-capitalised generally are under-capitalised in the more efficient modern types of equipment. This, of course, adds to the cost of production by lowering output per man engaged on these units as well as adding to the overhead costs of the units produced.

Thus the units of production at present do not now necessarily bear any very close relationship to the optimum sizes and types of units for producing specific commodities. In fact, the present scale and lay-out of the great majority of farms were determined by conditions very different from those prevailing to-day. To effect changes which would readjust the size of unit to our knowledge of the best methods of production and use of equipment will require a very radical treatment by way of reduction in the number of holdings and also their lay-out. At the same time, there is, of course, no one economic size of farm, but several optimum sizes, varying according to the type of organisation and the kind of farming pursued.

There is further a need for changes in farm lay-out. The awkward shapes of many farms have a number of harmful effects. Farm buildings are often badly placed in relation to the farm as a whole, but the farm may be so badly shaped as to make any rearrangement of buildings difficult or impossible unless a redistribution of outlying fields is attempted. Cases very often occur where fields which are practically adjoining farm buildings, and which by every canon of efficiency and economy should belong to the same farm, are yet parts of a different holding; in consequence, the outlying portions of that farm are distant and difficult of access. Again, the proper provision of water for livestock in the fields is hampered by the peculiarities of farm lay-out.

It is scarcely necessary to point out that adjustment in lay-out should vary according to topographical and soil conditions as well as type of farming. The difficulties of re-planning and readjustment are greatly increased by the multiplication of small ownership, caused by the increase in the number of owner-occupiers. The difficulties of concerted planning arise both from the greater number of units involved and their small size.

Small-scale farms and fields are directly opposed to the larger scale of operation required to make the fullest use of modern farm machinery and implements, and the most economical method of farm organisation.

Farm buildings are also often inadequate for running the holding. The farmhouse and cottages too may not be satisfactory according to present-day standards, and the number of the latter may not suffice for the staff which would be required to run the farm properly.

These problems emphasise the constant inter-connection between economic and social factors, between the land as a commodity and the basis of the agricultural industry, on the one hand, and the countryside as the scene and centre of rural communal life, on the other. For the homes of the farmer and his employees must be at, or immediately adjacent to, their place of business, and the farm is thus an industrial unit and a social-group unit in a way that works are not. This affects the positioning of farmhouses and cottages. If rural communities are to enjoy social services, as, for instance, water, power and light, the cost of the provision of these will vary enormously with the degree of dispersion of the rural dwellings. With proper planning, therefore, rural dwellings would be grouped into village units in such a way that, without neglecting other considerations, they would give the most economical units for the provision of these services. But this would vitally affect the positioning of farmhouses and other farm buildings, and this, in turn, is dependent upon, and might require changes in the lay-out of the farms.

Therefore, in any scheme of agricultural reorganisation, the following problems would require to be tackled:—

- (i) The readjustment of the size of the units of land ownership and management.
  - (ii) The readjustment of the size of units of farm management and operation, that is, farm holdings.
  - (iii) The readjustment of the shape of farms.
  - (iv) The redistribution of fields, and the adjustment of their boundaries, to rectify faults in lay-out.
  - (v) The provision of adequate farm buildings and dwellings.
  - (vi) The re-positioning and rearrangement of farmhouses and other farm buildings, with reference both to the convenience of the individual farm, and the formation of economic grouping of villages.
- (b) The division of responsibility for the provision of the farming capital, between owner and operator, is well known.

The landlord is responsible for the provision and upkeep of

the permanent equipment consisting of the land, farm buildings and dwellings, etc.

The tenant provides his own working capital, including implements and machinery, and livestock.

Permanent capital amounts to about two-thirds of the total investment, working capital the remaining one-third. At present, apart from a small area owned by the State and various corporate institutions such as the Ecclesiastical Commissioners, universities, colleges, and schools, all the permanent capital is owned and provided by private individuals, or on their personal security. Working capital is also provided from private sources, which may also be a handicap, but the fundamental difficulties of overcoming this are not quite so great as in the case of permanent capital, chiefly due to the fact that co-operative effort is easier to mobilise, and the nature of the investment is not of so permanent or long-term a nature, as the return on the capital expended is realised much more quickly.

The high proportion of derelict or semi-derelict farms which the recent survey carried out under the auspices of the War Agricultural Executive Committees has revealed, gives rather tragic confirmation of the depleted resources of landowners and farmers, and of their inability to furnish the necessary permanent and working capital required to keep or raise our agricultural assets to their maximum efficiency.

Both permanent and working capital are of vital importance in considering efficiency, as many farms to-day are under-equipped as regards both forms, and therefore productive output is reduced accordingly. Because of their straitened resources, landlords as a class are no longer well able to give a lead, as it was formerly their pride to do, in the introduction of permanent improvements. Similarly, as working capital is almost entirely dependent on the fortuitous financial circumstances of the farmer, who has no medium for utilising the savings of the general body of investors to finance his enterprise, many farms have had to be run on antiquated and prescribed lines.

During the last hundred years agricultural production has made considerable progress in certain directions, possibly as much as any other industry, but this has been very unevenly distributed between the many units of production. As technological and business conditions have changed, the disparity in comparative efficiency has tended to widen. This has been inevitable from the very nature of financing each agricultural unit. The difficulties of financing any industry of the proportions of agriculture, considering the drastic economic changes of even the last two decades is apparent to all students of agri-

cultural economics, and the severe lag between scientific discoveries bearing on agriculture and their general introduction into farming practice is due to this fact. Yet the difficulty has to be overcome if agriculture is to take its proper place in our national economy.

The factors which hinder the adequate capitalisation of agriculture at the present time may be summarised as the long-term nature of much of the investment in permanent improvements, the incidence of Death Duties, etc.

Under the present system of private estates, the land is both a form of personal property and the basis of an industry, in a way that other forms of privately-owned capital, such as factories, and mines, and merchant fleets, are not. Through this dual relation the investment by the landlord of capital in permanent improvements often has little direct connection with the possibilities of profitable and economical resources. It is affected :

- (i) Partly by his available resources—because he relies upon these rather than appealing like the industrialist to the general investing public to allow him the use of their surplus resources.
- (ii) Partly by the manner in which he divides these available resources between the requirements of his estate and his private purse.
- (iii) Partly by the presence in landownership of incentives to investment other than the expectation of a purely monetary return. This state of affairs tends to lead to both over-investment and under-investment.

As regards over-investment, there is no doubt that many landlords have invested capital in land out of all proportion to its capacity to give a reasonable return on the outlay, and have let the farms at comparatively low rents. Why? The landlord may be led into unprofitable expenditure through a variety of causes: Where the over-investment is *unconscious* and therefore *involuntary*, it is because the landowner may not have sufficient knowledge or seek adequate sources of advice to enable him to decide where the profitable limit of investment lies; consequently capital is invested unwisely. This applies, especially in the case of less wealthy landlords. In such cases, however, the farmer is seldom in a position to resist the wasteful investment, but usually he has to bear its cost through an increase in rent.

But the principal motives for *conscious*, voluntary over-investment, especially by landlords with ample resources and particularly where their income is mainly derived from channels outside the land, arise from the fact that they are inclined to

view the question of improvements from a standpoint quite other than that of economic efficiency.

He may be actuated by personal regard for the individual tenant or general good feeling, which causes him to be lenient in assenting to demands for expenditure upon improvements.

He may be possessed by the desire to obtain one or other of the non-monetary advantages which landed proprietorship still more or less affords, and may therefore consider his expenditure a sound investment if it yields to him the desired advantages in this direction, quite apart from an adequate return in income. Thus, an owner whose forbears have retained possession of a property through many generations may be impelled by family sentiment to keep it intact and to spend his resources indefinitely on its maintenance, despite the fact that his capital would yield him a higher return if invested elsewhere; he finds satisfaction in the knowledge that his family name and perhaps an hereditary title will continue to be linked with the estate through his effort. Another type of case, probably more important in former times, but still not negligible, is that of the prospective parliamentary candidate in a county constituency, who is either already a local landowner or becomes one after his adoption. He, at least, will not consider it wise to earn the reputation of being indifferent to the demands of his tenants. Again, the acquisition of a country residence and its agricultural surroundings is reckoned as a social index of business success; hence, in periods of industrial booms there is always a fresh influx of newly-enriched industrialists into the market for landed estates. Usually the new landlord feels that it is incumbent upon him to maintain his reputation for wealth by being generous in the matter of capital expenditure for his tenants and in gratifying his satisfaction at the appearance of a well-maintained domain. Further, possession of an estate with historic associations has a definite amenity value even if the property was acquired by the present owner long subsequent to the events for which it is famed. Finally, many new owners acquire a genuine taste for rural occupations, and proprietorship becomes a fond hobby on which they are willing to spend freely. In such circumstances, an enthusiastic but indiscriminating desire to encourage scientific farming may sometimes lead them into expensive courses. If they run home farms, they are enabled, by their indifference to the economic touchstone, indirectly to undercut professional farmers.

All these personal factors, which together have made "the pursuit of agriculture one of the most honourable ways of losing money", help to show how inadequate monetary returns operate much less strongly there than in other forms of investment to



prevent the owner from developing his property in unproductive directions. While this type of investment may be to the advantage of the tenants on such estates, it is not conducive to the existence of a healthy, progressive agriculture, and is the antithesis of the conception of farming as an industry.

There is again the completely opposite state of affairs, where the farm suffers from under-investment on the part of the owner. The landlord whose resources are strained is compelled, often against his knowledge and inclinations, to refuse requests from the tenant to provide capital for permanent improvements which would be economically advantageous. Or it may be that through ignorance or indifference he may not realise the true situation, and therefore refuses to do anything. This has had a marked effect in the past on the efficiency of agriculture.

The investment of capital in permanent equipment for agricultural purposes should be decided in each case upon the principle of comparative advantage, that is, the ability of this type of investment to compete with others as regards returns, taking the risk element into account. Some may think that this is too high and rigid a standard to apply, but it is surely involved in the postulate that agriculture is an industry and should be treated as such. Changes in investment should be taking place continually in response to changes in external factors, such as markets, transport and the development of competing areas, but especially the technical advances of science and technology.

A further consideration of some importance concerns the types of farming that should or should not be encouraged to meet post-war conditions. In light of the increasingly reliable statistics of production which are now available through the marketing schemes, at least in peacetime, the conscious guidance of production is a much more feasible and a safer procedure than formerly. The necessary changes and adjustments can probably be controlled most readily by limiting the permanent capital expended on certain types of farming and by increasing the amount spent on others.

The necessary changes in the reorganisation of land utilisation cannot be effected without both adequate capital and sufficient reserves to enable the owner, whether corporate or individual, to await the necessarily slow returns from such a type of expenditure. In the present system it is often asking too much of private landlords to expect them to take such a long-term view as is here required, for the span of a single life is relatively short in comparison with the productive period of many types of agricultural investment and their returns. This has tended to retard the alterations which are necessary.

Further, agriculture has suffered more than any other industry

through the incidence of taxation. Provision has to be made on every estate for meeting death duties at periodic but irregular intervals, on the passing of the owner. The immediate realisation of considerable sums to cover these charges may deplete capital resources, which require to be conserved and constantly replenished in order to meet the cost of repairs and renewals and to provide for development. This gives rise to periods of impoverishment for many landed estates, and in consequence farms are starved of an adequate amount of capital.

It is not necessary here to argue at length on general grounds, either whether Death Duties discourage saving and dissipate capital, or whether the uses to which the State puts the proceeds are as beneficial socially as those to which individuals have put them before they have passed to the State. It is, however, desired to stress two practical considerations which have special reference to agriculture :

- (i) As the State does not at present actively engage in the ownership or management of agricultural land, the uses to which the proceeds of Death Duties upon agricultural land will be put, however generally advantageous to the community, will be different from their previous uses. There will, in other words, be a diversion of resources from land ownership to other forms of activities which are undertaken by the State. The cash represents capital which is diverted from its use in agricultural development to the general purposes of Government, which, while at present they include many forms of State aid to agriculture do not include any systematic assistance to schemes of long-term improvement. The movement will be in one direction only : capital will be drawn from agricultural improvement but will not be diverted to it. Although this point is very significant from the point of view of the agricultural industry, at any time, it has assumed a vital importance under the stress of war, and will remain so after hostilities have ceased, through the impoverishment of our national resources.
- (ii) The effect of Death Duties upon the accumulation of capital for agricultural development is complicated by the fact that whereas over a large field of industry the joint-stock form of enterprise has become predominant, the ownership of agricultural land in this country has remained very largely a matter of strictly private enterprise. While this remains so the necessity of meeting Death Duties affects the scale of the unit of land ownership and control, and, in the case of farms owned by their

occupiers, of the unit of operation. In the case of a testator whose property is tied up very largely in industrial undertakings the Death Duties can be met by the sale of a requisite portion of debentures or shares. Such a transaction will not impair, diminish or divide the existing capital assets of the undertaking, only cause a transfer of title of a portion of them. Nor will it affect the continuity of control or management.

In the case of a landed estate which is in private hands, the position upon the death of the owner is quite different. Here there is not merely a change of ownership, but also a change in control. As the assets of the concern are not aggregated and then represented collectively by stock it is not possible to meet the Death Duties by transferring a certain proportion of stock, leaving the physical assets undisturbed and undivided, unless sufficient cash is in hand to meet the liabilities without selling off or starving of capital a portion of the estate. It may thus be necessary to part with or otherwise divide portions of the assets of the concern, thus causing changes in the scale of control and of operation. Assuming that the estate was previously of the optimum size, this cannot but have adverse effects upon the efficiency of operation and the rate of return to capital.

From an economic point of view, the position cannot be met by proposals made by some landowners, that Death Duties might be accepted by the State in the form of parcels of land. This might be personally convenient to the person concerned, by enabling them to settle the Duties with the least trouble and loss. But it would not ensure that the portions of the land either remaining to them or handed over to the State, constituted convenient units of control and operation. It would thus diminish the economical use of agricultural land. At present the State has no machinery by which land so handed over could be operated, at least as agricultural estates. If it were diverted to the purposes for which the Government normally requires land, it would mean that considerable areas, much of which were probably best fitted for agricultural purposes, would be diverted to a use for which they were less suited.

(c) A great factor in the failure to attain the highest standard of technical efficiency in agricultural production is due to lack of knowledge and also resistance to change on the part of landowners, farmers and workers.

Landlords to-day have generally ceased to lead agricultural thought and improvement, as in the past. Few of them take professional training to fit them for their task of agricultural leadership. Where the duties of handling estates are left to professional agents or stewards the position is little or no better,

as their technical training is hardly suited to meet the many-sided problems of commercial agriculture.

To a certain extent the tendency of farmers to lag behind in using the knowledge available has been modified by the system of advisory and extension services which has been available to them during the last twenty years. The advance due to this factor has been very appreciable; but here again it has been evident that those who stood most in need of these services from an efficiency point of view have been able to make the least use of them. By this, it has not to be assumed that the expenditure of public funds on such work has not been justified. In fact, the contrary is the case, as the statistics of production show. The problem now is to bring the general standard of efficiency for each particular type of enterprise up to that of the better units of production.

#### *Proposals for Re-organisation.*

In what ways, and by what means, can British agriculture be reorganised to play its fitting part in the post-war economy of the country?

Fundamental to the problem of the efficiency of agricultural production is a solution of the four problems briefly touched upon in this memorandum:

- (1) The control and guidance of the land into its most technically-efficient and socially beneficial uses.
- (2) The reorganisation of units of land management and of farm operation in the most efficient sizes and shapes.
- (3) The adequate yet not wasteful capitalisation of the land, in respect of both permanent and working capital.
- (4) The raising of the standard of knowledge and competence among landowners and farmers.

If all the land in this country were at the disposal of, and under the full control of, the community, the task of reorganisation would be comparatively simple. A central land authority could undertake a complete survey of the natural resources of the country, in order to determine the most appropriate uses of areas, whether for building, recreation, mineral working, or agriculture, and would then proceed to allot them to these uses. An agricultural authority, the Ministry of Agriculture, having settled in collaboration with the other Ministries concerned, the part which home agriculture was required to play in the national economy, and the types of foodstuffs needed, would plan the distribution of the land zoned as agricultural among the different crops and stock. It would be able, by research and enquiry, to determine the optimum sizes of land manage-

ment and of farming units, the amount of fixed and of working capital required to maintain their efficiency, and the most appropriate forms of management; and it would then proceed to apply the results in practice. Where estates and farms differed from the optimum conditions, as they would in a great many, if not in most cases, it would be possible to replan and reconstitute them from above.

But in practice in this country at present the comparatively small area of land available is held by a large number of different owners, and farmed by a much greater number of operators. Therefore, in any proposals for reorganisation under the existing form of private ownership the present estates and farms must be taken as the initial units. Such planning and control as is to be adopted must therefore be a judicious blend of private initiative, local co-operation and central direction. I think it is clear that our agriculture cannot give its best contribution to the common good without considerable *Government assistance* on one side, and the complete mobilisation of *individual initiative* on the other. Government action will be necessary to give direction to output and to provide capital where this is not easily forthcoming from private sources. Equally it will be advantageous to make the fullest use of local knowledge and experience, and to make provision for individual initiative in the running of farms.

This task has such a many-sided aspect that I consider that it would require a distinct central organisation to undertake it. I suggest the creation, within the Ministry of Agriculture, of a Department of Agricultural Planning and Development, under a Director-General. It may be well to point out at the outset that there is nothing revolutionary in this proposal. All the major Departments of State have periodical reorganisation, when the challenge of changing conditions and new needs require the modelling of new administrative machinery. The creation of a Directorate-General within the Ministry actually occurred previously in 1917, when Mr. T. H. (now Sir Thomas) Middleton, who was, and remained, an Assistant Secretary of the Board, became first Director-General of the Food Production Department. There are too in the Ministry at the present time Departments specially charged with responsibilities for Fisheries and for Wales, under-secretaries who rank as Principal Assistant Secretaries of the Ministry. Another instructive instance is in the Air Ministry where the needs of the development of civil aviation have called for the creation of a separate Department, entrusted to a Director-General of Civil Aviation, who is directly responsible to the Secretary of State, and whose Department is altogether distinct from the Departments of the Ministry relating

to the R.A.F. The question of agricultural policy is so important that it might be worth while considering whether the Director-General should rank as Chief Agricultural Adviser to H.M. Government, parallel in status to the Chief Economic, Industrial and Diplomatic Advisers to H.M. Government.

It is only necessary to sketch in outline the main functions to be entrusted to the Department of Planning and Development, and the machinery by which it would discharge these. It might include :

- (1) Land Use Bureau.
- (2) Land Management Bureau : with Sections dealing with Credit, Management, and Land Improvement and Permanent Equipment.
- (3) Farm Management Bureau : with Sections for Credit, Farm Management (including, perhaps, the supervision of the Regional Economic Advisory Service) and Working Equipment (the last have sub-sections for Farm Buildings, Machinery and implements, Livestock and Crop Production).
- (4) Agricultural Advisory and Extension Services are so vitally bound up with the problem of increasing the efficiency of management and production, that the control of these might be entrusted to a separate Bureau of this Department. Here it may be remarked that the farmers are helped by these services, but there is no parallel organisation to assist the landowner who is in need of knowledge and advice. Could not this be made a function of the existing regional advisory service, or become the province of a regional Land Management Service ?

How would the Division undertake its work in developing the planning and policy of agricultural development ?

I suggest that each landowner, either of a substantial estate or a single farm, should be required to prepare a scheme, showing the following data :

- (a) The extent, location, lay-out, sub-division and present disposition of his agricultural land.
- (b) The nature, value and condition of the permanent capital equipment of the land.
- (c) The directions in which expenditure upon replenishing and extending the capital equipment and improving the productive capacity of the estate have been undertaken, within a stated term of years.
- (d) The directions in which further expenditure would be advantageous.
- (e) The extent to which the owner would be able to provide the capital for the suggested improvements out of his

own resources, and that to which he would need additional assistance.

These schemes would be submitted for approval to Regional Land Commissioners, who might be appointed in the manner of the Regional Traffic Commissioners—small bodies of disinterested and knowledgeable nominated members, who would be willing and able to devote more time to this work than could be done by the County Agricultural Committees in their present form. Their professional staff would consist of officers allotted to the Region by the Planning and Development Department. They might also avail themselves of the knowledge of local agriculturists by the appointment of district advisory committees. If, after receiving the advice of these officers and committees, they agreed that the scheme of improvements put forward by the owner was likely to improve the efficiency of the estate and would add to its earning-power, they would formally approve it; if the professional officers, after visiting the estate, reported that further or other improvements were required, these might be added to or substituted for the original draft scheme, as additions or alternatives. Once the scheme is approved, they would be open to receive representations from the owner that, if he were not in a position to obtain all the capital required to undertake the improvements from his own resources or through existing credit facilities, he should receive assistance from the Ministry. If they find, upon examination, that these representations are well founded, they would notify the Land Management Bureau's Credit Section, which would undertake a fuller investigation into the efficiency-factor of the project and the credit-worthiness of the owner. If this investigation proved satisfactory, the Land Credit Section would arrange the provision of the requisite finance, from the extended credit facilities which would be required to implement any comprehensive system of land improvement in this country to-day.

I have not outlined the above administrative structure from any fondness for the creation of new government agencies, nor do I propose it because I consider that the existing bodies are useless. I do so because I am firmly of the opinion that if any steps are to be taken to raise the efficiency of our land utilisation, our land management and our farm management in the post-war era, the problem will have to be tackled with a just appreciation of all the factors involved, giving to each its due weight, and this naturally requires the establishment of a unitary body combining the determination of the policy and planning relating to all these factors. Its function in relation to the provision of credit for permanent improvements, which I have sketched, is only one example of the activities which might be entrusted to

it. I feel that if British Agriculture is to be properly run, and is to be equal to undertaking the vital part which it will be called upon to play in our post-war Britain, the problems of its efficiency and its adequate equipment will require to be tackled, as they are being in the United States, in a "big" comprehensive way, with a broad, fresh outlook, and an energising spirit, which will have as little of the dictatorship as possible, but which will nevertheless afford real guidance and leadership, and only control and compulsion where these are really necessary.



## QUESTIONNAIRE ON AGRICULTURE AND THE NATIONAL PLAN

CERTAIN agricultural problems are being investigated in regard to the further development of existing urban and rural settlements and also the laying out of completely new settlements.

With a view to the possible combination of agriculture and industry it is of special interest to know the relationship of the areas of land to the number of people employed thereon, and to the population of the settlement as a whole in connection with the acreage of land required for the healthy living of the whole community.

Taking settlements, for example, for populations of 4,000, 10,000 and 20,000 respectively, it is important to know eventually the areas of land required to feed those populations, the number of persons that could be employed as regular workers on it and those for whom other employment would have to be found.

### QUESTION 1.

What would be the proportion of people employed in agriculture and horticulture respectively?

For instance, what would be the number of regular workers needed for so many acres of:

- (1) Field crop production—
  - (a) Grain crops
  - (b) Hoe crops
  - (c) Feed crops
  - (d) Commercial crops
- (2) Garden crop production—
  - (a) Vegetables
  - (b) Fruit
- (3) Meadows
- (4) Pasture?

What would be the proportion of workers for whom there would only be seasonal work on each of the foregoing types of cultivation? This is essential to know in order to find the number of people who would be available for part-time agricultural industry or for other industries, in order to develop a sound diversification of industry within the settlement.

### QUESTION 2.

What would be the proportion of workers employed in

- (1) large-scale mechanised farming
- (2) small-scale farming,

in relation to the acreage and crop yields? In other words, to budget for the minimum cultivation we should know the labour involved in the two extremes of:

- (a) highly mechanised
- (b) not mechanised cultivation.

## QUESTION 3.

What is the combination of crops and catch crops which may be grown on the same piece of land but at different times of the year?

Also, what is the percentage of loss, due to rats, etc., transport and waste in retail business, in yields for all the different crops, or just those for which it is large enough to need consideration?

## QUESTION 4.

What are all the possible agricultural industries, i.e. those industries which rely directly on the produce of the land for their raw material, e.g. potato distillery, brewery, canned food manufactories and all those concerned with the utilisation of dairy and market garden produce?

Which are those which it is only economic to run on a large scale, and those that can be economic on a small scale?

## QUESTION 5.

Which agricultural industries should be situated at the centre of production, and which should be at the marketing centre? This presumably will be decided by the ease and the cheapness in transportation of the raw produce and the finished goods.

## QUESTION 6.

What would be the amount of raw material required to supply the different types of agricultural factories so as to make them economically worth while? For example, how many tons of hops would be required per year to supply a brewery in order to make the specialised machinery for producing beer an economic proposition?

## QUESTION 7.

What would be the diversification of raw products which could be handled in the same factory so that it could be kept running all the year round?

This is important to know so that one can arrive at the acreage of land required to provide the factories with their specific raw produce—and so relating that to the existing distribution of settlements, find out the number of settlements which would have to co-operate in sharing one of these agricultural factories.

## ANSWER TO A QUESTIONNAIRE ON AGRICULTURE AND THE NATIONAL PLAN

*Supplied by*

THE HENRY FORD INSTITUTE OF AGRICULTURAL ENGINEERING

### QUESTION I.

MOST common vegetables can be produced most economically under field rather than garden conditions. The numbers of people employed directly in producing food for settlements with populations of 4,000, 10,000 and 20,000 respectively can only be arrived at after consideration of types and acreages of various crops which it would be desirable to grow; the farming methods to be followed; the amount of mechanisation possible, etc. It is extremely difficult to assess the number of workers who would be required for a given acreage of any crop. That crop will be part of a rotation, one effect of which will be to ensure a cropping sequence which will provide work on different crops at different seasons. Thus no crop will provide for the expenditure of labour on itself alone the whole year round. The first two questions can then be best answered after estimating the needs of different settlements in terms of acreages of various crops. The main *direct* needs will be:

- (a) Vegetables, including potatoes, greens—brussels sprouts, savoys, cabbages, cauliflowers, etc.—peas, beans, carrots, parsnips, etc.;
- (b) Cereals; (c) Meat; (d) Milk; (e) Fruit; (f) Eggs.

Indirectly, foods for livestock: kale, mangolds, beans, etc., will be required.

Production can be divided between (1) an agricultural section, including large-scale market-gardening; (2) an horticultural section—mainly glasshouse production—and (3) a fruit section.

#### (1) THE AGRICULTURAL SECTION.

To assess labour requirement for this, the required acreages of various crops must first be ascertained.

- (a) Main-crop greens (brussels sprouts, savoys, etc.). Assuming an average requirement of  $\frac{1}{2}$  lb. per head per day,  $3.5 \times 52 \times 4,000$  lb. per year would be required by a 4,000 community. This equals approximately 320 tons. Assuming a reasonable crop to yield 150 pots (40 lb.) per acre, this could be grown on 120 acres. However, main-crop greens would often be replaced by peas, beans, cauliflowers, etc., and supplemented by home garden produce so as little as 50 acres should suffice.
- (b) Field green peas would follow conveniently and 50 acres (yield:  $150 \times 40$  lb. bags per acre) should suffice a 4,000 community. A little of this acreage might be given over to runner beans.
- (c) Spring greens (spring cabbage, sprouting broccoli, etc.). Spring cabbage could be thinly drilled on land ploughed after peas, would require little labour and could be fitted in here as a catch crop. A yield of 2 tons to the acre would supply sufficient for a 4,000 population.

- (d) Following spring greens, such crops as carrots, runner beans, lettuce, outdoor tomatoes (in suitable districts), parsnips, etc., could be fitted in. Fifty acres under such crops should produce sufficient for the smaller community.
- (e) Wheat would conveniently follow the above crops. This is an important cash crop; it would give the land a complete change and would produce straw, valuable for the livestock.
- (f) Potatoes would complete the rotation and with an average consumption of 4 lb. per head per week an average yield of rather less than 8 tons per acre would be sufficient for a 4,000 community.

The suggested rotation on acreages required for a 4,000 community is then :

Brussels sprouts, savoy, etc.	50 acres
Peas	50 "
Spring greens	50 "
Carrots, lettuce, etc.	50 "
Wheat or spring corn.	50 "
Potatoes	50 "

Thus a sufficient supply of fresh vegetables could be produced on approximately 250 acres of good arable land. These crops could be produced on a field scale and full use could be made of mechanised cultivation. Moreover, the cropping programme is such that the labour requirement is well spread throughout the year.

The suggested rotation produces six valuable crops in five years. It could be extended by introducing barley or oats, following wheat. This may be deemed desirable following consideration of the livestock requirements.

However, the livestock requirements of communities of the suggested sizes would be so large as to merit separate consideration.

For the type of farming as suggested above, the regular labour required would be in the nature of 3 people per 25 acres, decreasing slightly as the acreage increases.

For the suggested communities the acreages of land and the amounts of regular labour needed would be approximately as follows :

4,000 community	250 acres, requiring say 28 regular workers (of whom 8 could be women)
10,000 community	620 acres, requiring 60 regular workers (12 women)
20,000 community	1,200 acres, requiring 100 regular workers (20 women)

Of these the 620 acre unit would probably be the most economical. Some of the machinery required on the 250 acre unit would tend to be underworked. The larger acreage would probably be more than a handful for a foreman.

In each case the farms could be largely mechanised, relying on tractors for all the main cultivational operations: ploughing, preparation of seed beds, row crop work, etc. One medium-sized tractor per 100 acres approximately would be required.

*Casual labour.*—Taking the 620 acre farm as a standard, an available force of casual workers numbering up to 100 would be invaluable in removing crops quickly when they are at their best. The crops for which most casual labour will be required are peas and potatoes. Speaking generally, casual labour would be required in large numbers for short periods, and it is estimated that this labour through the year would constitute approximately 20% of the total labour requirement,

*Labour required on livestock, etc.*—The number of animals kept for meat production and consequently the number of people engaged in keeping them, etc., would be greatly influenced by the extent of self-sufficiency aimed at. It would probably be deemed desirable to rely to a certain extent on imported meat to satisfy the demands of the community.

### *Meat.*

(a) *Beef.*—The labour requirement could be assessed readily after deciding on the number of animals to be kept. Under reasonable conditions this should be in the neighbourhood of one man per 100 head of animals of varying ages.

(b) *Pigs.*—When producing pork and bacon for the suggested communities probably the most economical method would be to divide the production into three sections :

Breeding section for sows and piglets to weaning age.

Weaner section for pigs from weaning age to approximately 100 lb. live weight.

Fattening section for final fattening after 100 lb. live weight. With this type of organisation and with well-appointed buildings the direct labour requirement would be one man on each section to deal with 100 sows and their progeny.

(c) *Sheep.*—With a semi-grass flock for the production of lamb and mutton (i.e. a flock which would occasionally run on arable land—say brussels sprouts and cabbage “stubble”, kale, etc.) the direct labour requirement would be in the nature of one man per 300-ewe flock. To provide an average of  $\frac{1}{2}$  lb. mutton per head per week throughout the year the progeny of, and the culls from, a 1,000-ewe flock of a prolific breed would be needed by a 4,000 community, relying on its own production.

(d) *Milk.*—Taking  $\frac{1}{2}$  pint per day as the standard requirement of liquid milk, the needs of a 4,000 community would be supplied by a herd of 120 cows in milk with an average yield of 750 gallons approximately. With machine milking the labour employed directly in the cowsheds and dairy could well be four men and one dairymaid.

(e) *General.*—Together with such livestock a complementary farming system would have to be practised for the production of arable feeding crops, straw crops, hay, etc. For this type of general farming the labour requirement, in addition to stockmen as above, would be approximately 2 men per 100 acres, decreasing as the acreage increased and greater mechanisation became possible, e.g. for 500 acres of such land six men in addition to stockmen should suffice.

### (2) THE HORTICULTURAL SECTION.

The size and consequently the labour requirement of a horticultural section would depend largely on the type of production aimed at, e.g. whether luxury goods (flowers, hothouse fruits, etc.) were to be produced in addition to more normal consumers' goods (tomatoes, cucumbers, etc.). Where only the latter is the aim the amount of labour required can be assessed on a basis of 12 people per 3 acres of glass, with well appointed modern glasshouses.

**(3) THE FRUIT SECTION.**

The acreage of various fruits required is based on the following assumptions :

- (a) 1 acre of most soft fruits (given average yields) would satisfy the needs of approximately 5,000 people annually for eating and home jam-making.
- (b) 1 acre of plums would suffice 1,500 people annually.
- (c) 1 acre of pears would suffice 500 people annually.
- (d) 1 acre of apples would suffice 200 people annually.

Thus for eating, cooking and home jam-making, etc., a fruit section of some 50 acres would be required by a 4,000 community. This would require little labour—say three regular workers and some half-dozen casual workers at busy times.

Where fruit was grown for canning and jam-making the acreage would, of course, be greatly increased.

**QUESTION 2.**

With the types of production as outlined above it is estimated that over 80% of workers would be employed on farms where all main cultivations were mechanical.

**QUESTION 3.**

The first part of the question is answered above. The crops where loss due to transport and waste in retail trade is the greatest, are such things as fruit and vegetables. This *infrequently* reaches 30% or 50% of the crop, but much of this is due to such things as labour shortage at vital times ; uncertainty of markets, etc. Much of this would then be eliminated where production is planned to meet the needs of communities.

**QUESTION 4.**

Among industries relying on the produce of the land are, for example, brewing and distilling ; sugar-making ; jam-making ; canning ; production of breakfast foods (corn flakes, etc.) ; dried potato chip production ; butter-making ; cheese-making. Of these, butter- and cheeses making could be carried out economically on a small scale, and canning of fruit and vegetables on a fairly small scale.

**QUESTION 5.**

All except brewing would be best situated near the production centre, but nearness also to the distribution centre would be an advantage. With brewing, nearness to marketing centre is most important.

**QUESTION 6.**

Small breweries which have difficulty in competing with larger concerns must necessarily produce some 7,000 gallons of beer a week, and provide for the wants of some 90,000 people. Single sugar factories handle thousands of acres of beet.

*Canning.*—The produce of a few hundred acres, say, 5 or 6 would be sufficient to merit the economical running of a canning factory.

*Jam-making.*—It could be profitably carried on with the produce of a few hundred acres. Both canning and jam-making would deal more economically with the produce of a larger acreage but the smaller concerns are not too uneconomical.

**QUESTION 7.**

Canning factories should find suitable vegetable products at most seasons of the year.

# DATA CONCERNING AGRICULTURAL AND RURAL INDUSTRIES

*compiled by*

THE ASSOCIATION FOR PLANNING AND REGIONAL RECONSTRUCTION

TABLE A. THE PRINCIPAL AGRICULTURAL PROCESSING INDUSTRIES

Raw material.	Process or plant.	Products.
Apples . . . . .	Cider press and processing Plant	Cider Apple juice Pectin
Barley and Hops . . . . .	Malthouse Brewery Distillery	Malt Beer Stout Spirits Brewers' grains
Eggs . . . . .	Packing station Process plants	Graded eggs Egg powders Liquid eggs Food drinks
Fish . . . . .	Cannery Packing Curing Drying Processing	Canned, preserved or dried fish Fish meals Fertilisers Fish oils
Flax . . . . .	Retting Mill	Linen Webbing
Fruit . . . . .	Preserving Canning Drying	Jellies Jams Canned fruits Fruit juices Dried fruits
Grain . . . . .	Threshing Milling Provender mill Bakery	Straw Flour Provender Balanced rations Bread
Grass . . . . .	Drying Grinding Baling	Cattle food
Herbs . . . . .	Drying Distilling	Essences Flavourings Medicaments
Meat . . . . .	Slaughterhouse Curing Canning Preserving Butchery Bacon factory	Fresh meat Preserved meats Bacon and ham Lard, suet, dripping Sausages Smalls By-products (see Table C)

Raw material.	Process or plant.	Products.
Milk	Dairy	Milk
	Bottling	Cheese
	Cheese-making	Evaporated milk
	Chemical processes	Milk powder
	Evaporation	Casein
	Butter	Milk sugar
Potatoes	Pulping	Lactic acid
	Distilling	Cattle food
	Drying	Potato flour
		Spirit
		Starch
Seeds	Breeding	Seed
	Sorting	Cattle food
	Grading	
	Packing	
Straw	Pulping	Paper
	Drying	Furniture
	Chaffing	Building materials
	Spreading	Hats
Sugar beet	Pulping	Sugar
	Distilling	Molasses
		Pulp
Timber	Sawmills	Furniture
	Pulping	Agricultural
	Wood industries	equipment
	Forest industries	Fencing
	Nurseries	Fittings
		Charcoal and other
Vegetables	Grading	timber products
	Packing	Tinned vegetables
	Canning	Bottled
	Drying	"
		Dried
Wool	Spinning	Pickles
	Weaving	Blankets
		Cloth
		Flannel
	Tweeds	

TABLE B. SOME PRODUCTS OF MINOR AGRICULTURAL INDUSTRIES

Animal products (see Table C)	Drinking straws
Beeswax	Drugs
Birch brooms	Feathers
Bird foods	Flavourings
Breakfast foods	Flock
Bulbs	Hemp
Cattle cake	Honey
Cellulose	Kapok
Charcoal	Malt extract
Cricket bats	Malted milk
Cultures	Matting
Dextrine	Mushrooms
Dog biscuits	Mustard
Down	Oilseed



Some Products of Minor Agricultural Industries—*continued.*

Parchment	Tobacco
Peat	Vegetable extracts and essences
Potato crisps	Vellum
Rape oil	Vinegar
Rat poison	Wickerwork
Resins	Wine
Sawdust	Yeast

TABLE C. USE OF ANIMAL WASTE PRODUCTS

Material.	Possible Use.
Blood . . . . .	Blood albumen for calico printing Blood meal Clarifier for sugar refining Disinfectant ( <i>Carbo animalis</i> ) Dried blood fertiliser Dried blood meal Fire foam (from serum) Plastics (A. W. Palmer) Potassium cyanide (used in production of) Serum
Bone . . . . .	Buttons Bone marrow Bone meal Glue
Fats . . . . .	Glycerine Lubricants Soap Suet Tallow
Hairs and bristles . . . . .	Brush-making Mattresses
Hides and skins . . . . .	Plaster Textiles Artificial manures Hide glue Leathers Prussiate of Potash
Horn . . . . .	Fancy goods Size
Inedible carcases . . . . .	Blood meal Bone meal Glues Glycerine
Intestines . . . . .	Bladders Gut Sausage
Offals . . . . .	Glandular extracts Glue Manure Pharmaceutical products erepsin hæmoglobin pancreatin pepsin rennet trypsin
Wool . . . . .	Shoddy Grease

TABLE D. INDUSTRIES OF MORE OR LESS FIXED LOCATION

Arsenic	Ores—aluminium, barium, copper,
Boatbuilding	iron, lead, magnesium, tin, zinc
Brickfields	Peat
Cement	Potteries
Chalk and chalk products	Salt
Charcoal	Sand
China clay	Saw-milling
Clay products	Seaweed
Coal	Sewage and compost plants
Firebricks	Shale (for paraffin—wax and ammonia)
Fishing	Silicon
Fish hatcheries	Slate
Fish industries	Stone quarrying and processing
Flint	Tidal power
Glass	Tourism
Gravel and Ballast	Waterpower, and industries im- mediately dependent thereon
Gypsum	Waterworks (reservoirs, etc.)
Lime	
Limestone	
Magnesium (from seawater)	

# INDUSTRY

## INDUSTRY AND PLANNING

by

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ADEQUATE treatment of the issues raised by the title of this contribution would require a volume of considerable size. It is impossible to do more than submit a skeleton statement of the factors that must be taken into consideration in planning the future distribution of the population of this country. We know that during the period lying between the two world wars, and largely at the expense of other parts of the country, there was a marked movement of the occupied population into London and parts of the Home Counties. The first question that arises is whether this movement was inevitable. If the reply is in the affirmative there is little more to be said about it. In the sphere of the inevitable no question of control, or the desirability of control, arises. But if (as I believe) the movement was not inevitable we are immediately faced with the question whether it was desirable. This question cannot be answered without reference to a standard of judgment. And standards differ. People are not agreed upon what they want. That which seems a curse to one seems a blessing to another.

The Royal Commission on the Geographical Distribution of the Industrial Population (1937-9) unanimously agreed that the movement was neither inevitable nor desirable, for which reason they submitted recommendations designed, if not to undo the mischief already wrought, at least to prevent further mischief of the same kind. Although they were not agreed upon the means by which the desired ends or "objectives" might best be achieved, the objectives were not in dispute. But the evidence of some witnesses indicated a difference of opinion either upon the degree of inevitability present in the movement or upon the desirability of that movement in the circumstances of the time. Their views were probably shared by many others.

This illustration is submitted for a twofold purpose. The first is to stress the need for clarity in any discussion of policy. Before any advance can be made we must know what is and what we want. In an analysis of "what is" we must distinguish between the inevitable and the avoidable. That which is inevit-

able presents no problem calling for solution. By definition it is unavoidable; whether we like it or not we must accept it, like a May frost that destroys the blossom on fruit trees. We can but endeavour to prevent undesirable and avoidable consequences, which we do when we put on an overcoat before going out into the "inevitable" rain. If, however, "what is" constitutes something that is avoidable, and differs from what we want, it presents a problem. There can be no agreed solution, however, unless we first agree upon what we want. If large towns are unavoidable (whether we like them or not) it is a waste of effort to try to prevent their creation, but it is not a waste of effort to direct their growth. We must accept them, but we may still determine their character. If they are not unavoidable there will be many who will still regard them as desirable. We shall not all agree upon the end in view.

My main endeavour in this brief sketch is to distinguish between the inevitable and the avoidable or controllable. I have used the word inevitable in a broad economic sense. There are, of course, physical limits to the power of the reformer. We could not, if we would, build industries similar to those that flourish in tropical climates. Our fate as a nation is largely determined by geographic influences. But, for practical purposes, the sphere of the inevitable is even wider than that determined by geography. History, too, has a say in the matter. We start with what we have inherited from the past, and much of that has been woven into the inevitable fabric of the future that matters. It would be physically possible to destroy London, disperse the inhabitants and restore the Thames to the position of another Severn, but no reasonable being would advocate such a measure. Even if, given a fresh start, such a state of affairs were desirable, the product of history known as the present situation is such that the gain from such an upheaval would be vastly outweighed by the loss that would be incurred not only in wealth but also in other elements that jointly constitute human welfare. That which could and should be changed, and what change, if any, should be made, must be determined by the balance of relevant considerations, the weight of each being a matter of individual judgment.

The other purpose for which the illustration in the second paragraph was submitted is to suggest that the "objectives" of the Royal Commission may now reasonably be accepted as a standard of judgment. We may not all agree upon the precise end that should be sought; it may be that most people would disagree with one or more of the group of conclusions or the words in which they are framed, or the emphasis that they are given. But the reception accorded to the Report of the Com-

mission suggests that that body succeeded in describing the general direction of the goal of the vast majority of reformers. There is far greater measure of agreement now about what we want, though there may still be serious disagreement about the manner in which we should seek it.

## I

Man must work in order to live and reside within reasonable distance of his work. For reasons that need not here be elaborated a large proportion of the industrial population now work together in large groups, in mines, factories and other establishments, while industrial and commercial establishments have tended, in the past, to grow in clusters. It is for this reason that the great majority of the people are massed together in towns of various sizes. But that is not all. When people work together in large industrial units, and therefore live in close proximity to each other, they attract others who live by ministering in various ways to their needs. Similarly the main industrial and commercial establishments attract other, smaller, establishments to perform various kinds of services subsidiary to their own main services. Thus the towns appear, at first sight, to be much larger than are justified by the number and size of the main establishments.

When we examine the activities of the occupied population of a town we find that a considerable proportion are engaged in local industries and services, such as transport, electricity and gas production, retail distribution, municipal services, hair-dressing, tailoring and dressmaking, domestic service, law, education, accountancy, religion, etc. These are found in every community; they satisfy local needs that cannot be satisfied from a distant source; they present no problem of location. They are distributed throughout the country roughly in proportion to aggregates of people employed in industries of another kind.<sup>1</sup>

The majority of the town or local community, however, are employed in providing goods or services wholly or mainly for other communities. It could not be otherwise. Just as most of the products of a farm are sold by the farmer, who, with the proceeds, pays for food, drink, clothing and numerous other goods and services obtained from outside so, too, the goods and services provided by a town for the outside world ultimately pay for the flour, tea, coffee, oranges, and numerous other goods

<sup>1</sup> The proportion varies from about one-fifth of the total occupied population in a highly industrial area to about two-fifths in others. Holiday and health resorts fall into a special category: local services are provided for a visiting population, and therefore belong to the category "basic" industries.

and services brought into the area from the outside world. Without such industries the local community could not exist; inhabitants would be compelled to disperse (unless they were kept alive by the charity of other communities) in order to avoid starvation. These industries (including services) are the foundation upon which the town has been built, and may therefore be called "basic" industries. Their size will determine the size of the industrial structure and population of the town; no town can grow merely by adding to an already adequate supply of local industries and services.

The basic industries of a town or other small area are the ones that present a problem of location; there may be many possible sources of supply, so that the selected source must have offered or be prepared to offer an advantage over its competitors. Nor should it be forgotten that the area of choice varies with the character of the industry and its product. At one time about three-quarters of the total British output of tinplate and far more than one-half the total output of cotton fabrics were exported to other countries. The choice of location was therefore international and, within the country, national. But there are many industries which serve, in the main, a national market and others, such as biscuit manufacture, a regional market. Nearly the whole of the coal output of West Yorkshire mines is consumed within the region of production; the South Wales coal industry formerly exported about one-half of its output; before the war the South Yorkshire industry was largely dependent upon its own region for a market, but sent part of its output to neighbouring areas while a smaller part was exported to other countries. An industry serving a regional market clearly offers less choice of location than an industry serving a wider market. On the other hand, the former cannot be regarded as a basic industry of the region that it serves, although it remains a basic industry of the smaller community within which it is situated.

Every area, large and small, must contain some industries that "export" their products to the world outside that area, in other words, no area can be wholly self-sufficient. These "exporting" industries constitute the foundation of the economic structure of that area. No scheme of "planning" can be successful which does not secure the maintenance and development of such industries. Thus, for example, the foundation of Yorkshire, in the economic sense, is provided by the textile industries, coal-mining, steel production and other industries that "export" their products to the world outside Yorkshire; and these, or alternative "exporting" industries, must be maintained if the people of Yorkshire are to remain inhabitants of the county. Similarly Great Britain must maintain her exporting

industries if she is to maintain her present population; they constitute the foundation of her economic structure. On the other hand, just as a Yorkshire farmer may flourish by selling all his products for consumption within his county so, too, a Yorkshire town may flourish upon basic industries the products of which are not "exported" beyond the boundaries of the county. But a large proportion of the towns (like the county as a whole) can only exist if the products of their industries serve markets outside the county.

Although this general statement is no more than an economic truism it is a truism that is frequently ignored. The first concern of the planning agent is the industrial structure. The first task of those who designed Letchworth and Welwyn Garden City was to secure that "basic" industries would be attracted: the inhabitants of the towns could not be expected to live by taking in each other's washing. The first task of those responsible for the rebuilding of Hull (which may be submitted as an illustration of those areas that have suffered most heavily from enemy action) is to find out whether the firms in the city's "basic" industries intend to rebuild their factories in the same area. Most of these were inherited from the past so that their owners are for the first time faced with the problem of location. If they decided that Hull was not the most desirable location and if no alternative basic industries could be attracted those responsible for the reconstruction of the city would need to plan for a smaller population than in the past. But if (as is extremely likely) the factories, etc., will be reconstructed in or near Hull they will be able to plan for a larger population. Their second task is to provide sites and facilities that will promote the development of the industries to be restored and others that may be attracted. It may thus be repeated that the industrial structure of the community is the foundation of its social structure; without adequate provision for basic industries (by which is meant provision that succeeds in attracting and holding such industries) planning in the wider sense must end in failure.

## II

The basic industries of a community may be divided into three groups. The first consists of those the location of which is determined wholly or mainly by nature, the most obvious examples being mining and shipbuilding. The location of the former is determined by the location of the mineral, while that of the latter must obviously be at or near the mouth of one of the few suitable rivers in this country. But nature herself may offer several alternatives, in which case the choice will be determined

by changing technical and economic considerations. At one time coal-mining was largely confined to outcrops and seams (usually narrow) near the surface, but now deeper and thicker seams have been brought within reach by the use of modern technical equipment. The development of the large steam-driven steel ship resulted in the concentration of the modern shipbuilding industry upon the Clyde and the north-east coast, partly at the expense of many small boatbuilding centres. It will thus be seen that the centres of industries, the location of which is determined by nature, may shift slowly on account of changes in technical and economic factors. Nevertheless, their location cannot be seriously affected by deliberate action on the part of public authorities.

The second group of industries consists of those that have concentrated in particular regions for reasons that are largely hidden in the past. They may reveal a high degree of concentration but the selection of the region may be largely a matter of historical accident. Once established they acquire a momentum that enables them not merely to persist but even to grow long after the original causes that explain their location have disappeared. They acquire advantages, such as the existence, in the neighbourhood, of skilled labour and of subsidiary industries and services of various kinds. These are usually called external economies, which are also enjoyed by the first group but are relatively more important in the second group. Some external economies are of a special or technical character, such as the type of skilled labour employed in the industry, engineering and repair factories that serve the main industry, special markets for the raw material and finished products and the many economies that accompany the concentration of different stages of production in the same area. Other external economies are of a more general character and to be found in all industrial concentrations. Further reference to these will be made below.

The most obvious examples of industries included in the second group are the cotton and wool textile industries, cotton being mainly concentrated in East Lancashire and wool and worsted in the West Riding of Yorkshire. Why they should have become so largely concentrated in those regions is still a subject of investigation among economic historians; all that need here be said is that at a critical stage of growth the regions offered a more complete combination of favourable circumstances than any other region. There was no single outstanding or determining factor in either case. But, as time went on, external economies of a special or technical character became important and favoured further concentration and growth; and among such economies was the growth of an engineering industry



that specialised upon textile machinery. This factor is no longer of the same importance to the textile industries, but the proximity of the latter was, and remains, a highly important factor in the location of the textile engineering industry.

Irrespective of the root causes of location it may be submitted that for all practical purposes the second group of industries may now be combined with the first in the sense that for the purpose of any scheme of planning they must be regarded as "immobile". Their present location must be accepted as being among the "inevitable" economic facts. And the two groups include most of the exporting industries of this country—coal-mining, the production of steel and steel products, shipbuilding, branches of engineering, the cotton and wool textile industries. Jointly they comprise nearly the whole of the industrial foundation (i.e. the basic industries) of Great Britain. Anything that injures their foreign markets or weakens their efficiency in supplying those markets tends to reduce the possible standard of living of the community as a whole. Any plan, be it national or regional, that ignores this fundamental fact, is bound to be injurious in the long run.

If all the basic industries of this country fell into these two groups the problem of planning would be far more restricted than it will be when the war is over. Planning could be little more than the replanning of existing industrial areas by local and county authorities, operating either separately or in groups under the existing Town and Country Planning Act. There might be some scope for decentralisation, but little or none for planning and development on a national scale. The industries would need to be accepted as they stand. A large and ever-growing number of basic industries, however, fall into a third group, characterised by a high degree of mobility. There are no obvious natural causes that bind them to particular areas: their location is determined by factors that are under human control. Usually they use material that can be conveyed a considerable distance at a cost that forms but a small part of the total cost of the finished product; often they are established near the homes of their creators; generally they tend to be near pre-existing supplies of labour that can easily be trained for their tasks; in the great majority of cases they manufacture highly fabricated finished products—consumers' goods—of a fairly light character. Nor should we forget that the choice of location has been greatly extended by the growth of road transport and the use of electricity as a source of power.

Many examples of such industries might be given if it were necessary to do so. All the basic industries of Welwyn Garden City and Letchworth fall into this group, as well as a large pro-

portion of the comparatively new industries that have sprung up in the London area. The growth of a large motor industry near Oxford, of large chocolate establishments in York, and of various branches of light engineering establishments in many parts of the country is due to the fact that the owners began on a small scale, near their own homes, and displayed sufficient business capacity to command success. If they had lived and experimented elsewhere their establishments would have grown there. It is clear that those falling into the third group (which is already large and always growing) are the industries with which planning (in the sense in which the term is usually employed) is mainly concerned and the industries that give significance to the view that planning should be under the direction of a national authority.

### III

The question is frequently asked whether industry attracts or is attracted by population. The answer, in general terms, is fairly simple. Just as an industry is dependent upon transport facilities so, too, it is dependent upon an adequate supply of labour. But the labour need not be already on the spot: new areas are developed by attracting labour from other places. Thus the rapid industrial growth of (say) the Durham area in the nineteenth century was made possible by the influx of workers from the surrounding agricultural areas and from other parts of the country. In that case population followed industry, yet the local development of industry was only made possible by the fact that labour was sufficiently mobile and could thus be attracted to the new mines and ironworks. Recent examples of population following industry, on a large scale and over great distances, are to be found in the U.S.S.R. and in Germany, as well as in London and the Home Counties and in several parts of the United States of America. In the U.S.S.R. the location of the new industries was mainly determined by geographic factors, and proved in well-known cases to be identical with the location made desirable by strategic factors.

Given the fact that labour must be available the answer to the question will therefore be determined by the character of the industry. If, as in the case of the first group, the location is mainly determined by geographic factors, it is clear that population follows industry; but if the industry is mobile, in the sense already indicated (i.e. if it falls into the third group), its location is largely determined by the external economies of a general character offered by "competing" areas, and among such economies the existence of an ample supply of labour may be

of the first importance. Thus, for example, the existence of an industry employing male labour means that a large supply of female labour is available which may attract other industries in which such labour is required on a large scale. Leeds was such an area; it attracted industries that could not have grown in the textile towns farther west, where already the main basic industry (wool textile manufacture) absorbed the available supply of female labour. But Leeds industries now normally employ so much of the available female labour that the new mobile industries requiring such labour tend to grow in the surrounding mining areas.

This brings me to the heart of the problem of planning in relation to the location of industry. It should not be forgotten that if an industry grows at the same rate as the total occupied population, employment in that industry grows at a lower rate than the latter, for in every industry technical improvements mean an economy of human effort per unit of output in goods. When a new area is developed the local growth of the main industry is so rapid that people are drawn into the area from outside, and at that stage subsidiary industries and other local industries lag behind. At a later stage, when the main industry grows at, say, the national rate for industry in general, the rate of growth of the local population exceeds the rate of growth of demand for labour in the main industry. The resulting surplus may for a time be drawn into the lagging local and subsidiary industries, but eventually either associated industries are attracted by the existing external economies of a technical character (witness the growth of the heavy engineering industry, producing stationary engines, in the shipbuilding areas) or independent industries are attracted by the existence of external economies of a general character. Thus regional specialisation ultimately produces diversity. If it fails to do so the population that exists in excess of the demands of the main basic industry and the resulting local industries will find it necessary to migrate to other regions. Hence the inevitable migration of population, in all countries, from rural areas to the towns.

The redistribution of population that is always proceeding becomes a real and important social problem if, as in the mining areas of South Wales, the main industry fails to grow at the national rate and such areas fail to attract alternative basic industries. If the failure is due to previous failure to provide external economies of a general character—such as transport, housing and the usual amenities of a well-organised industrial area—the problem can be partly solved by a progressive social policy; but if it is due to natural causes, which repel alternative industries, the only solution is to be found in large-scale migra-

tion. It need hardly be stated that, in consequence of the fall in the rate of growth of population, this problem may become even more acute in future than it has been in the past. Migration is more likely to be followed by an absolute decline in the total population of the area.

Between 1923 and 1937 the population of London and the Home Counties grew at a higher rate than the total population; that of the West Midland area grew at approximately the national rate; that of other areas either grew at a lower rate or (in one or two cases) actually declined. The London area was full of expanding, mobile industries; Glamorgan (for example) was one of the main homes of declining industries belonging to the first group and had very few mobile industries; the West Midlands contained a large number of the first and third groups and reflected the national industrial structure. Thus large numbers migrated from Glamorgan and similar areas to London and the Home Counties, while the migration to and from the West Midland area balanced.

. It seems to me, in the light of this brief analysis (from which all refinements have been excluded through lack of space), that the national planning authority should ask itself certain elementary questions, among which the following may be quoted: What distribution of population do I regard as ideal as between regions and within each region? What industries must be accepted as falling into the first two groups? How far is the future prospect of such industries likely to be affected by strategic needs and post-war trends in international trade? To what extent do their prospects affect the possibility of achieving the ideal distribution of population? What industries fall into the third group and what are their probable future? To what extent is it possible and, if possible, desirable to extend such industries in areas likely to suffer from a decline in their respective basic industries? Planning that ignores such questions degenerates into mere "physical reconstruction" and the reconstruction, in that sense, of some areas that may easily become derelict. The national planning authority will recognise, if it is to succeed, that planning must be based upon a sure industrial foundation. It is, indeed, in this elementary fact that we find the real—and convincing—argument for the establishment of a national planning authority. Moreover, it points to the conclusion that the planning authority should be something much more than a Government department concerned with so-called "physical reconstruction". The ultimate problem is economic, not architectural.

# SOME SOCIAL ASPECTS OF INDUSTRY IN RELATION TO PLANNING

*by*

D. B. WILLIAMSON, B.Sc.

## 1. INDUSTRY AND HUMAN NEEDS.

IN this country and in America there have been various efforts to formulate a healthful and decent standard of living. This is especially desirable for the basic human needs of food, clothing and housing. The post-war production of these and other indirectly-concerned commodities should be planned with a view to producing sufficient material for such a decent standard of living. This does not imply unnecessary luxury. Simpler, more wholesome living is wholly acceptable, but widespread malnutrition such as obtained in the pre-war period should not be tolerated. In the nutrition field, present dietetic trends may make the attainment of a "decent standard" easier in some ways than before the war. Similarly, the movement towards lighter clothing and fabrics which followed the last war will certainly be accelerated by this war with its accent on physical fitness, by the growing knowledge of the value of sun and air, and by the developments in synthetic textile materials. This should again rather simplify the attainment of a "decent" standard. Clearly, it should not be assumed that such a standard implies as a matter of course a vastly increased productivity. But whatever be the decent standard decided upon, that should be the positive objective and the production capacity of industry should be based on that objective.

## 2. INDUSTRY AND AGRICULTURE.

There is a growing understanding of the ultimate necessity for a combined industrial-agricultural social structure. At its crudest, such a structure will give industrial workers fresh food, and the environment for physical, mental and spiritual recreation; and will give the agricultural workers the benefits of mechanisation, electrification, water supply and so forth, together with social and educational facilities and access to new conceptions in thought, in art and in science available in the past only to the city dweller. At its richest, it opens up the conception of a new way of life in which industry and agriculture will no longer be separate functions of different groups of men, but will be combined so that men will be part-time workers in industry

and agriculture. This is the way of life towards which our mastery of the machine must inevitably lead us. In planning the redistribution of the industrial population it is important to bear this process in mind.

### 3. INDUSTRY AND THE CONSERVATION OF MATERIAL AND ENVIRONMENT.

The past century has seen the prodigal use of natural resources and the resulting devastation of the landscape. Ugly and forsaken mines, Satanic mills and derelict houses. Polluted rivers, treeless hill-sides and literally blasted heaths. Losses in material, in beauty, in soil fertility and in health of man, animal and plant, beside which the destruction due to bombs falling on our country is negligible.

Conservation of material and of environment are complementary. Take the example of the polluted urban river. It is useless as a civic or recreational amenity; fish no longer enter it; land fertility is lost. If the organic materials are conserved by a proper disposal scheme, land fertility is restored, and the river can become a thing of beauty giving life to the community.

Knowledge of strength of materials is making possible the conservative use of materials in all branches of engineering, resulting in lightness, increase of speed and decrease in energy consumption.

The conservation of energy, material, environment and labour are all closely related, and in planning industrial production the conservative use of materials should be encouraged; and the value to the community realised of using scrap materials, and of salvaging materials from industrial and urban wastes.

As regards environment, two tasks confront us. First, in the congested areas to be redeveloped and dispersed, to consider in what ways the scars and squalor of past industry can be healed: by good town planning, by laying out parks, by afforestation and suitable forms of agriculture. Secondly, to plan new settlements with the conservation and development of natural beauty as a foremost consideration.

### 4. INDUSTRY AS AN AMENITY.

“Where there’s muck there’s money.” This saying has been a fair epitome of the industrial town of the past. Industries created towns, but dirty towns, in which the industries were certainly not regarded as amenities.

In recent years there has been a change. Following the lead of Cadbury and Rowntree, here and there companies have so organised their factories that they can invite a daily stream of visitors to see products in manufacture. For example, Shredded

Wheat at Welwyn, Montague Burton's at Leeds, Ford's at Dagenham. A company that shows its factory in this way has a first-class advertisement. And not only does it interest those who see the processes, it implies that the factory processes and premises are kept clean and pleasing and also that the workers are well treated. Poor conditions, antiquated workshops and overworked or underpaid workers are not subjects for publicity. Good conditions, good workshops, happy and busy workers are a first-class asset not only to the company but to the whole community. The advantages may be summarised as follows :

- (i) Factories are kept clean and the whole factory zone may be designed attractively, with the prospect of its retaining and developing its pleasing features.
- (ii) Hygienic conditions, good materials and workmanship are encouraged.
- (iii) Adequate working and welfare provision is made, giving improved conditions to workers and staff.
- (iv) Industrial disease conditions are studied and avoided.
- (v) The raising of the standard in "show" factories automatically improves conditions in other factories, beyond the minimum conditions required by Factory Acts.
- (vi) Visitors are entertained and instructed, spend money in the district, and spend more on the product when they go away.
- (vii) Residential areas can be located in good conditions nearer to the factory area than formerly.

Neotechnic show factories symbolise the new outlook and will of mankind. The outlook of frankness and friendliness in human relationships, the will to cast out dirt and corruption and ugliness from among us and to let in sunlight and fresh air and beauty. The "show factory" should become the rule rather than the exception.

## 5. INDUSTRY AND UNEMPLOYMENT.

The general problem of unemployment lay outside the Terms of Reference of the Royal Commission. Yet, on our former basis of life, with increasing mechanisation, greater unemployment is only to be expected. It is quite clear that redevelopment, dispersal and diversification of industry cannot reduce unemployment. On the contrary, the efficiency of industry "re-developed, dispersed and diversified" and technically advanced by war is bound to be much greater, and potential unemployment will be correspondingly greater. Productivity per man in most industries including agriculture is increasing, and advance in the technique of conservative utilisation of materials is reducing employment in others, e.g. in coal-mining.

Therefore, in addition to the redistribution of population, we require to bear constantly in mind the need for *redistribution of work among the population* so that each may have his opportunity for leisure from essential production, for education, for recreation, for adventure of the mind and spirit.

In the post-war world, we must hope to prevent unemployment by establishing a decent standard of living, by redistributing the industrial population with all that that infers, by special projects, by raising the school age, by the mergence of industry and agriculture, by shortening working hours and by spreading employment more evenly among the population.

This last must be done to save men from the demoralisation and wastage of unemployment, if for no other reason. Men's lives are the wealth we can least afford to despoil. It is the common right of every man to be a full member of the community and to make his contribution to the community. "There is no wealth but life," said John Ruskin. Mankind is on the threshold of having life more abundantly.



QUESTIONNAIRE  
ON  
INDUSTRIAL LOCALISATION FACTORS <sup>1</sup>

THE Royal Commission on the Redistribution of the Industrial Population recommended that the objectives of national action should be :

- (a) Continued and further redevelopment of congested urban areas, where necessary.
- (b) Decentralisation or dispersal, both of industries and industrial population, from such areas.
- (c) Encouragement of a reasonable balance of industrial development, so far as possible, throughout the various divisions or regions of Great Britain, coupled with appropriate diversification of industry in each division or region throughout the country.

An essential step in such a programme of action is to establish the localisation factors of individual industries.

The following questionnaire has been designed for this purpose. It comprises two sections :

SECTION I. This is designed to establish the localisation factors that pertain to an industry as a whole.

SECTION II. This seeks to establish the desirable size of a production unit of the industry, so that if a unit of the industry were to be established in a settlement its spatial and environmental requirements could be met correctly and provision made for other industries to give diversity and any necessary interdependence.

With regard to the existing establishments of an industry whose mobility might be considered, decisions would be governed by the information derived from Sections I and II. The final decisions in an individual case would necessarily be governed by local considerations, regional and national relocation considerations, obsolescence of the buildings and plant, etc. In general the case of each factory would require to be specially considered.

DEMOGRAPHIC SURVEY AND PLAN.

<sup>1</sup> Prepared by D. B. Williamson, B.Sc.



6. *Materials.*
  - (a) Raw materials, processing materials, other materials, e.g. packing.
  - (b) 1939 quantities, sources, transport.
  - (c) Any special considerations, e.g. keeping qualities in relation to transport and storage, adequacy of supplies, e.g. water, etc.
  
7. *Products.*
  - (a) Main products, by-products, waste products.
  - (b) 1939 quantities home/export, transport.
  - (c) Any special considerations, e.g. keeping qualities, bulk, fragility, etc.
  
8. *Power.*
  - (a) Nature and source of energy.
  - (b) Tendencies to change, e.g. coal or gas to electric.
  - (c) Is all-electric working achieved, desirable and/or economic (i.e. using electric drives, furnaces, and electric boilers for steam raising if necessary)?
  
9. *Equipment.*
  - (a) Proportions of industry's capital investment in fixed equipment shafts, buildings, heavy plant.
  - (b) Proportion of capital investment in lighter plant, tools, etc.
  - (c) Rate of obsolescence of equipment.
  
10. *Marketing.*
  - (a) Transport, road, rail, canal, sea, air.
  - (b) Specialised transport equipment, e.g. lorries, trucks, barges, loading gear.
  - (c) Marketing: deliveries, servicing, sales contacts, accessibility, etc.
  - (d) Publicity: have the products and/or processes "show factory" potentialities? E.g. Food products, clothing, automobiles, etc.
  
11. *Costs.*

As a guide to the *relative* importance of various costs, please give approximate costs, expressed as percentages of cost of finished product, of the following:

  - (a) Materials.
  - (b) Labour.
  - (c) Power.
  - (d) Transport of materials and of product.
  - (e) Overheads.

12. *Relations to other industries.*

- (a) Do the products of this industry form the raw material of other industries?
- (b) Are these receiving industries preferably located near by?
- (c) Are any of the materials used by this industry the products of other industries?
- (d) Are these supplying industries preferably located near by?
- (e) Relationships in labour, e.g. industries employing males and females respectively.
- (f) Relationships in transport, e.g. co-operative transport.
- (g) Business relationships.
- (h) Technical services and interchange of technical information.

13. *Relation to agriculture.*

- (a) What raw materials derive from British agriculture?
- (b) What proportion of products has an agricultural market?
- (c) What by-products have an agricultural market?
- (d) Has any form of part-time working in agriculture been established?

14. *Amenity factors.*(a) *Negative considerations.*

Does industry produce air or water pollution, dust, noise, smell, etc.?

Explosion or fire risk?

Any other reason for which the industry must be relatively isolated?

(b) *Positive considerations.*

"Show factories" whose location may be influenced by publicity considerations and which may provide a "tourist amenity" in a region. E.g. Shredded Wheat at Welwyn, Montague Burton at Leeds, Ford at Dagenham.

Residential and civic areas may be relatively near.

15. *Other factors.*

- (a) Climatic.
- (b) Traditional and historical.
- (c) Personal likes and dislikes.
- (d) Influence of cost of land, rates, etc.
- (e) Incompatibility, e.g. tall chimneys not to be near aerodromes, etc.

16. *Future trends.*

- (a) Necessary post-war production: short term, long term.
- (b) Possibility of equating production capacity to potential need or demand: what increase in production and in production capacity would this involve?
- (c) Should production for regional/national and/or world market be achieved by large units or by small and regionally dispersed units, i.e. in respect to social desirability, production economics, transport, servicing, strategic considerations, etc.?
- (d) New markets, e.g. aircraft.
- (e) Changing habits, e.g. nutrition, clothing, air travel, etc.
- (f) Changing needs, e.g. due to higher average age of: population,  
raised school age,  
increased technical knowledge.
- (g) New materials and their effect on the industry.
- (h) New inventions and improved technique.
- (i) Standardisation of sizes, design, voltage, etc.
- (j) Effect on post-war employment:  
of demand, temporary post-war and permanent,  
of amalgamation and compulsory concentration,  
of rationalisation,  
of technical development.
- (k) Post-war exports.
- (l) Possibility of part-time work in industry and agriculture, either for the individual, or for the family, i.e. a proportion of the family working in industry and a proportion in agriculture, or any other proposal. (See note below.)

*Note on the combination of industry and agriculture.*

There is a growing understanding of the ultimate need for a combined industrial-agricultural social structure. Before the war the five-day week was becoming common in industry. Industry "redeveloped and relocated" and technically advanced by war will have greater productive efficiency, greater output per man. Hence there will be greater potential shortening of the individual's working week (assuming that unemployment cannot be tolerated). Shortening of the working week gives opportunity for leisure and also for establishing part-time work in agriculture, which apart from other advantages provides a safeguard against industrial depression.

Ultimately our mastery of the machine must lead to such a

combined industrial-agricultural social structure. It is important that the inevitable progress in this direction should be recognised *now*, and provision made for it in planning so far as is possible. Industrial-agricultural schemes have already been operated abroad, mainly by Ford and others in the United States. It is possible that the process in this country may be hastened by the current emphasis on nutrition and horticulture.

*SECTION II. Localisation Factors of an Individual Factory in Relation to Town and Country Planning.*

For a proposed factory of the industry the following estimates and information are required :

- (1) Production and production capacity assuming, say, a regional market plus a percentage of the export market.
- (2) Quantities of raw materials, processing materials, etc.
- (3) Quantities of waste : solid, fluid, gas (smoke, dust).
- (4) Population employed ;<sup>1</sup> sex and age composition.
- (5) Land area of the factory premises.
- (6) Total floor area and number of storeys.
- (7) Other considerations that affect the lay-out of the factory in relation to environment :
  - (a) Roads, railways, canals, harbours, aerodromes.
  - (b) Loading bays, sidings, piers, works roads, etc.
  - (c) Fire risk, explosion risk, etc.
  - (d) Canteens, welfare, recreation, etc.
  - (e) Aspect, foundations, etc.
  - (f) Residential facilities.
  - (g) Preservation of amenities.
  - (h) Relationship of industry and workers to agriculture.
- (8) What other industries should be located near by :
  - (a) To provide raw materials, what quantities ?
  - (b) To take products, or by-products, what quantities ?
  - (c) To supply equipment or services ?
- (9) (a) Electric energy required, maximum demand kilowatts ?
  - (b) Process steam required, condition and quantity ?
  - (c) Other energy required, gas, coal, etc. quantities ?
- (10) Is the factory a "show factory" ?
- (11) Capital value of works buildings, and plant for such a factory (1939 values).

<sup>1</sup> From the population employed in this and other factories, and in the associated local services, etc., the total population of the settlement can be estimated. Hence the numbers of houses, schools, etc., can be decided and the lay-out of the settlement planned.

## DATA CONCERNING INDUSTRIAL FLOOR SPACE AND LAND REQUIREMENTS

*compiled by*

THE COUNTY PLANNING DEPARTMENT, GLOUCESTERSHIRE

THE following questionnaire was sent out by the County Planning Department, Gloucestershire. All the returns made are by responsible and well-known concerns in the country. The questions raised are of special importance to the lay-out of new industrial areas.<sup>1</sup>

The location of industry and population are closely related. These two factors are fundamental in the growth and development of towns, but in determining the structure of towns of the future it is important to know the requirements of your industry with regard to floor space and land per employee including staff, assuming (1) peace-time conditions, (2) that you had in mind the establishment of your industry on a new site which would, of course, comprehend your requirements for maximum efficiency and possibly recreational facilities for your workers. I should therefore be indebted to you if you would be good enough to inform me :

- (a) The area of floor space (including manufacturing, store and office) per employee.
- (b) The area of land (including land occupied by buildings) per employee.

Industry.	Space per employee (Factory, sq. feet).	Land (sq. feet).
Millers . . . . .	1,330	432
Refrigerating machinery . . . . .	200	300
Ironfounders, wire drawers, etc. . . . .	270	325
Agricultural and general engineers . . . . .	286	572
Potato crisps . . . . .	160	190
Table waters . . . . .	1,000	5,000
Abrasive and refractory materials . . . . .	432	432
Iron and steel hinges . . . . .	270	270
Metal plating . . . . .	280	290
Ball-bearings . . . . .	80	189
Oil, gas and electric cooking, heating appliances	400	400
Milking machines . . . . .	228	622
Mining plant . . . . .	350	650

<sup>1</sup> By permission of the County Planning Officer, G. E. Payne.

Industry.	Space per employee. (Factory, sq. feet).	Land (sq. feet).
Duplicators . . . . .	241	415
Tobacco . . . . .	258	376
Glue and gelatine . . . . .	220	—
Chocolate and cocoa . . . . .	283	365
Switchgear transformers, etc. . . . .	150	210
Recorders and instruments . . . . .	300	310
Engineers and contractors . . . . .	1,250	975
Metal spinners, stampers and sheet metal workers	500	300
Steelworks plant . . . . .	228	761
Carpets . . . . .	216	405
Radio manufacturers and electric engineers . . . . .	100	522
Knitted underwear . . . . .	134	363
Electric and motor accessories . . . . .	150	300
Munitions . . . . .	200	154
Lacquering, polishing, etc. . . . .	200	—
Telephone apparatus . . . . .	94	122
Tyres and other rubber goods . . . . .	268	563
Spinners, bleachers, dyers, etc. . . . .	258	193
Patent belting . . . . .	600	500
Handbags and travel requisites . . . . .	300	350
Soap, etc. . . . .	307	733
Metal, bronze and iron work . . . . .	230	270
Pianos . . . . .	2,000	871
Art printers, embossers, etc. . . . .	101	56
Casein material . . . . .	286	857
Bolts and nuts, etc. . . . .	400	1,180
Ham and bacon curers . . . . .	444	859
Silk fabrics . . . . .	936	2,475
Brewers, wine and spirit manufacturers . . . . .	121	109
Casks and barrels . . . . .	135	544
Brushes, etc. . . . .	283	1,642
Leather, goods . . . . .	130	315
Cables . . . . .	290	535
Toffee-de-luxe . . . . .	144	126
Small arms . . . . .	168	162
Wool and leather . . . . .	400	1,125
Cotton dyers, etc. . . . .	190	106
Concentrated foods . . . . .	150	1,000
Jams, jellies, etc. . . . .	230	145
Half-tone blocks . . . . .	150	100
Ammonia-developed photo papers and cloths . . . . .	234	331
Engineering, etc. . . . .	335	300
Cameras, etc. . . . .	113	98



## RAILWAY ELECTRIFICATION AND POST-WAR RECONSTRUCTION

by

K. H. JOHNSTON, M.A.

RELATIVELY little damaged as the railways may be, there are few fields so rich in opportunity for regeneration after the war or for indefinite expansion of the service rendered to the State. It was war-time curtailments of renewals and repairs to steam rolling stock between 1914 and 1918 that furnished half the cost of the electrifications so unreservedly successful on the Southern Railway. But this is a mere trifle to the future lying before the other main-line groups, provided only the plans are ready and approved for immediate adoption when hostilities cease.

It is the more disturbing, therefore, to find so little thought directed towards the modernization of the country's transport system—ever a chief determinant of progress and opportunity and now the skeleton or framework on which the location of the new housing and industrial centres must largely depend. It is proposed, for instance, to disseminate productive units throughout the countryside with a view to securing the interconsolidation of industry and agriculture and enabling employment in these two spheres to be undertaken concurrently on a part-time basis. In his book, *Industry and Trade*, Professor Marshall has, indeed, shown how the spread of communally supplied electricity makes it possible to organise industrial production in small units, each concentrating on some narrow range of product, say, one particular size and shape of screw, instead of in large and probably unhealthily situated factories manufacturing the respective products in all sizes and patterns.

Here is an opportunity not to be missed. Just as steam pervaded the age of unco-ordinated individualism, so, perhaps, does electricity symbolise the new conception of industrial structure—permitting, as it does, the evolution of the small unit as an independent yet harmonised element of an organic whole. By such means utilised to the full, could be achieved an interdigitation of industries that would mitigate the effects of seasonal fluctuations or slumps, so disastrous in any region depending on a single affected industry as its mainstay. It is hoped, too, to take the pressure off the London area by establishing sub-metropolitan districts round leading provincial cities.

Clearly, plans so far-ranging postulate communications equally boldly conceived. Despite dense population and apparent pro-

fusion of railway tracks, the country's transport facilities have proved wholly inadequate and a constant handicap to industrial activity. Manufacturers are now chary even of placing a new productive unit anywhere except on the periphery of some already overgrown consuming centre: so that the railway companies' policy of fostering the large town and the convenient large load associated therewith has in considerable measure defeated itself. The railways' have, indeed, been the great urbanisers of the past, designing both train services and charges for freight without regard to the cramping effect on the whole industrial organisation and structure of the country; without regard, even, to the ultimate partial frustration of their own ends. The grave evils attendant on such a policy may be gauged from the figures given in Mr. Richard M. Titmuss's book, *Poverty and Population*, wherein it is shown that, in the North, some 50,000 premature deaths a year can be assigned to the unfavourable conditions in the big towns. Largely, no doubt, the trouble springs from malnutrition. But, even here, better transport could help to ensure the necessary supplies of fresher fruit and vegetables; insomuch that it need no longer take up to three weeks for a cabbage to reach the consumer—to quote the experience of a medical man who recently took the trouble to carry out an investigation into such matters. The other factor, too, namely cramped and congested housing with the smoke and vitiated atmosphere that it implies, is known to play a great part in the spread of infectious and respiratory diseases, never to speak of juvenile and other forms of delinquency. Largely it is to poor communications that the present crowded and toxic conditions are due. Adequate transport is the leaven that should let in light and air.

With a rubber shortage that may last for years and an imperative need to minimise petrol and other imports after the war, the need for a comprehensive railway policy becomes apparent. The prospective saving of thousands of acres of valuable agricultural land and many £ millions on the construction of new arterial roads, rendered superfluous by improvements in the railway system, should afford a strong additional incentive. The road vehicle may have promoted commercial efficiency; but it has hardly adorned the countryside, and a section of this Memorandum is set aside to examine how far goods can be conveyed more effectively by rail.

But the provision of adequate passenger services is no less vital. If industrial workers are to be attracted into the country, there will be many who will desire ready access to their old circle of interests in the towns, and whose willingness to move into the new settlements may well turn on the speed and cost

of travel. Again, the southward drift of industry is not due merely to the marketing advantages of the area round London, but also to the desire of business managers to be near its other amenities. A transport machine that enabled the Lancashire or Yorkshire business man to come up to town in two hours in the evening and return in a like time the same night would be a powerful factor in conserving industry in the North.

Clearly we need services comparable with the fast electric trains that run every twenty or thirty minutes from New York to Philadelphia (86 miles) and hourly even to Washington, 226 miles away. When it is mentioned that there are some twenty-two 50-mile-an-hour expresses every day over the 950-mile journey between New York and Chicago, it will be seen how utterly inadequate are our own conceptions of main-line passenger services. The story is well known of the American engineer who described the British railway problem as a suburban problem on a gigantic scale, and such a view is fully borne out by the intensity of the services just referred to.

A modernised transport system would, moreover, be an invaluable instrument of social intercourse and industrial equilibration. The formation of study circles and pursuit of cultural activities of all kinds would be greatly facilitated—an important matter in times of increasing leisure and increasing need for an educated electorate. Farther on, too, it is shown that the cost of running an electric train capable of seating three or four hundred passengers is only about 1s. 8d. per train mile (inclusive of rail wear and tear)—equivalent to one-fifteenth or one-twentieth of a penny per mile per passenger. A new mobility could thus be given to labour. Persons thrown temporarily out of work in a depressed area could travel daily to and from some district of thriving industrial life, without the upheaval of a “fitting” and without ceasing to be a source of revenue to the depressed area in which they continued to reside. Thus would Ricardo’s concept of the “economic man” be brought nearer realisation than ever in the past and flourishing industries be largely disencumbered of the time-lag in providing adequate housing. Electrification loans could be granted by the State on the condition that workpeople from an impoverished area should be conveyed to the place of employment at the bare cost of providing the extra seating accommodation. And even this charge could probably be defrayed out of Unemployment Insurance benefit without raising the administrative difficulties or question of unfair discrimination between well and badly managed concerns on which previous suggestions for a more constructive use of these funds have foundered.

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The problem to be considered in this Memorandum is really a twofold one, relating partly to the provision of better facilities for the existing great towns, and partly to the use of railway electrification for attracting people out into new centres of population altogether. It will be easier to deal with the question of the existing towns first and, from the information reviewed under this heading, to indicate subsequently how the matter can be approached as regards the much more far-ranging schemes contemplated by the Demographic Survey. In this connexion, no clear-cut lead is possible, the choice of lines for conversion being essentially interdependent with that of the districts selected for development in the first instance.

In the case of the big towns, however, it is possible to be comparatively definite. For here there exists the possibility of forging a fundamental, high-speed, non-redundant transport machine out of the present medley of parallel and intersecting alternative routes that are a legacy of the competitive age.

A policy of electrification applied to the great towns would, moreover, have a most important bearing on the task of their reconstruction. As shown farther on, the capacity of a railway station for electric trains is far greater than for steam. If train services into London from the North were electrified, for example, it is probable that a single station like Euston, when reconstructed and enlarged, could cope with traffic at present flowing into Paddington, Marylebone, St. Pancras, and King's Cross. The gain to London in the shape of space for parks or other purposes requires no emphasis; and it is worth noting that three of the main lines just cited have points of close proximity or intersection with the Euston line, at which connecting spurs could readily be made.

Atmospheric pollution, too, in which the railways are bad offenders, perhaps contributes to give the big cities a prior claim over the proposed rural towns. The loss incurred by the country through smoke and the injury which it inflicts on property and health is estimated at over £60,000,000 a year, most of which, presumably, occurs in the great centres of population. As steam locomotives account for some 5% of the country's total coal consumption, it may be estimated that complete railway electrification would save about £3,000,000 a year, chiefly in the existing built-up areas. A considerable saving would accrue to the railway companies themselves through decreased maintenance of buildings and works, whilst railway stations in large cities could be completely built over, like the Grand Central Terminal in New York, now a very valuable site. It is worth mentioning, too, the American city which greatly diminished the cancer

death-rate on one side of the river by a policy of smoke-abatement in that area.

This is by no means to neglect the needs of the proposed new towns. Here, fast and intensive transport is the integrating factor that would enlarge the whole outlook of inhabitants who might otherwise feel cramped by their surroundings, enabling minor towns fifteen or twenty miles apart to be as readily accessible to each other as opposite quarters of a large city, whilst various services could be organised on a mutually complementary basis. But, in the first instance, it would certainly be feasible and might even be cheaper to provide the required facilities by steam or by Diesel-electric units, unsatisfactory as these would be when the traffic had developed to larger proportions. A substantial number of new towns could moreover be located along routes proposed for electrification in any case, as constituting vital links between existing cities.

Although financial considerations are treated in the following pages on more or less orthodox lines, this is done chiefly to indicate how a planned policy of electrification, combined with a general rationalisation of railway methods, might well pave the way for an all-round reduction of transport charges together with elimination of the extremely wasteful delays inherent in the present system. Probably it is largely due to the measure of rationalisation already effected under extreme war-time pressure of traffic that the railways have shown such a remarkable increase in their profits during the past year. As indicated later, a really radical improvement in transport facilities might easily lead to fundamental changes, both internal and external, in the whole industrial structure.

Before passing on, it may be noted that large-scale electrification would create much immediate post-war employment for an aggrandised engineering industry—otherwise liable to be left partially stranded when the present call for munitions ceases—as well as giving immense stimulus and drive to building activities and capital expenditure of all kinds. This circumstance constitutes an urgent additional claim for early official consideration of the whole transport question.

#### AN ELECTRIC ARTERY TO THE INDUSTRIAL AREAS.

In the past, it has been assumed that, for electrification to secure optimum results, it would have to be extended to virtually the whole track mileage of the country, excluding certain lightly-worked sections of line, in order to minimise expenses arising from dual working by steam and electric traction over converted sections. The cost of general conversion was estimated at so high a figure (some £261 million chargeable to Capital Account,

with a prospective interest yield of 6·7%) as to discourage the adoption of any electrification schemes at all.

Actually, however, the four main-line groups have so little inter-communication (especially in the matter of passenger traffic) that electrification of any one of them need not for a moment postulate conversion of the others. In the first instance, such a procedure would merely be to repeat the over-capitalisation incurred last century in providing two or three competitive routes from London to nearly all the big provincial cities. It would also violate the economic maxim of concentrating output on that part of the "plant" calculated to produce a maximum return. If, for example, there had been two routes from London to Brighton instead of only one, it is doubtful whether either of them would then have carried enough traffic to justify conversion on purely profit-making grounds. But there would never have been any doubt regarding the lucrativeness of electrifying one of the routes and using this for the bulk of the traffic, the other serving chiefly as a steam-operated relief line or overflow. Such, in fact, is the actual position regarding the two routes from London to Hastings, only one of which has been converted. The question naturally arises whether a similar policy might not be adopted for the various competing, or once-competing, lines that run from London to the industrial areas.

Under centralised planning, it is generally agreed that our railway system would first have taken shape as a fundamental non-competitive trunk system serving the main centres of population, supplemented by lines of lighter construction to penetrate and develop other areas. Translated into terms of electrified and non-electrified routes, such an economic ideal comes once more into the sphere of early possibility; and the task of post-war reconstruction affords incomparable opportunity for its realisation.

Although the proposed artery could undoubtedly cope with the heavier part of the traffic at present uneconomically split up over the five main lines, for instance, that run from London to the North, this is not for a moment to suggest that towns of secondary importance on the non-electrified routes would suffer a disabling depletion of their services. The type of trains that it would be proposed to divert on to the electrified metals would be such as had in any case called only at the larger towns, served by both the high- and low-speed systems. The all-round acceleration that would be rendered possible by such a segregation of fast and slow traffic would be beneficial even to places not directly served: witness the saving of nearly two hours that could formerly be effected in the morning journey from Carlisle

to London by crossing to the other side of England and catching the Silver Jubilee express from Newcastle!

Both towards the south-west and from London to the industrial North, the railway configuration lends itself readily to such treatment. But, because of its greater immediate importance, only the North will be considered for the moment.

Of the five main-line routes from London to the North, none affords such ready access to all parts as that from Euston. Birmingham, Liverpool, Manchester, Wales, and both the Scottish capitals come within the sphere of its existing services. By means of the old Midland branch from Rugby to Leicester, all the towns served by the old Midland system could be brought into communication with it, with hardly any addition to the existing distances from St. Pancras. Between Loughborough and Chesterfield, the L.N.E.R. metals might perhaps be preferred for their advantage in bringing Nottingham on to the trunk system. There might also be an L.N.E.R. offshoot from Leeds to the Middlesbrough and Tyneside areas; and a reunion with the Euston line could be effected at Low Gill junction, some 40 miles south of Carlisle.

It may be interesting here to recall the pressure that was brought to bear on George Stephenson to lay down the London and Birmingham railway through Warwick, and his choice of the route through Rugby because of its strategical advantages as an approach to the Midlands. It is pertinent, too, to recount another story, narrated in a letter to *The Times* on 4th April, 1912:

Between 1845 and 1850, I was junior partner in a Newcastle Glass Manufacturing Firm. (G. Hudson and R. Stephenson were also partners.)

G. Stephenson used to come and see us and was very kind to me as a young man.

In 1847, he explained to me that several of our operations were the results or effects of electricity and then proceeded to give me quite a lecture on the subject. There was very little use for electricity at this period. He also explained to me that several phenomena of human daily life were electrical, and said finally: "I have the credit of being the inventor of the locomotive, and it is true I have done something to improve the action of steam for that purpose. But I tell you, young man, I shall not live to see it, but you may, when electricity will be the great motive power of the world."

These words impressed me much then, and much more now that I have lived to see the near fulfilment of his prophecy.

Over the proposed electric artery, trains could be run at speeds of from 90 to 100 miles an hour and of the frequency already existing between New York, Philadelphia, and Washington.

The effect of such facilities on distribution of population will perhaps best be left for fuller discussion in a separate section. But it may be pointed out here that such high-speed services should not only help greatly in the conserving of industry in the North, but have also proved highly profitable in themselves, the Silver Jubilee express from Newcastle to London netting a profit of 13s. per train mile, compared with the 2s. 6d. accruing from the average L.N.E.R. passenger train. On lines so densely worked, it should be feasible, too, to install the system of cab-signalling that has rendered electrified sections of the Pennsylvania Railroad proof against accident or fog.

Though primarily concerned with passenger trains, the electric artery could also be worked to saturation with goods traffic during quiet hours. With close-coupled vans of adequate size, fitted with the continuous brake, the quantity of freight that could thus be handled would be immense. Even if a great shrinkage in the population were to come about, there would always be abundance of traffic to make the artery a success, since at present it would be unable to cope with all that could be concentrated on to it from parallel routes. The establishment of the artery would, in fact, provide an investment of the most remunerative kind entirely free from speculative risk.

At this point, it may be enquired what is going to be done with goods too urgent to be left over till the night and requiring delivery or despatch by day at points on the electric artery where the line was at such times monopolised by fast trains. Such a problem should present little difficulty in view of the existence of steam-operated routes within a very few miles at all points of the high-speed system. By an extended use of motor lorries, goods could readily be assembled at a number of focal points on the non-electrified routes and loaded on to fast goods trains, scheduled to stop only at such focal points. Such trains would fit in conveniently with semi-express steam passenger services retained to meet the needs of secondary towns not directly served by the electric facilities. The whole question of using motor transport in conjunction with goods trains is of such immense importance that it must be dealt with in a separate section, even if the treatment is necessarily of the briefest nature.

The scheme propounded above would provide for electrification under optimum conditions. For it is only when the existing main lines are crystallised into traffic lanes specialising in high and normal speeds that maximum carrying power can be secured. Nothing so interferes with the capacity of a railway line as lack of uniformity in the speed of the traffic conveyed. Even if it were resolved to electrify the whole main-line system, it is only



by such a segregation of fast and slow traffic that the full advantages could be reaped. For this reason, the establishment of such an artery would seem in any case a valuable first step, enabling practical data to be amassed that would be invaluable in regard to the taking of further decisions about electrification.

Certainly, it is idle to imagine that very fast long-distance communication is likely to be achieved in any other way. To run an occasional high-speed train on a line not specially reserved for such traffic, a headway of perhaps twenty or thirty miles of clear track is needed, with inevitable delay to other services. Clearly, intensive passenger services require tracks on which goods trains have either been relegated to the night or else diverted to other lines.

Nor is the problem likely to be solved by air. For a fast aeroplane capable of seating thirty or forty passengers, an increasingly long runway is required, such as would take up a good deal of useful land and could, in any case, only be provided well away from the centre of a big city. In the *Economist* of 9th November, 1935, moreover, it was shown that Messrs. Imperial Airways, after receiving State subsidies for £561,000, carried for dividend only £97,500, and that local air companies were still worse off. These facts are worth mentioning because it is so commonly imagined that the future of fast transport lies in the air.

The question of proposed new industrial areas is considered in a later section. But it may here be suggested that those which could not actually be located along the high-speed system itself could in many cases be given speedy communications with it by means of intensified branch-line services, provided by self-propelling units until the volume of traffic became adequate to justify track electrification. In this way, too, the country's communications between east and west would be greatly strengthened and industry encouraged to migrate outwards from the path of the main line, to which it has tended rather to adhere in the past. There would also remain adequate services of steam-hauled semi-expresses on those routes not converted to electric traction.

Before passing on, a few words must be said about the accompanying block, which has been prepared by kind permission of Professor E. G. R. Taylor and which illustrates how the proposed electric artery would meet the needs of those areas considered by Professor Taylor to be suitable for immediate industrialisation. Shaded territory is that which is deemed unsuited for industrial use under present conditions, either because of its fertility as agricultural land or for other reasons, prominent among which is inaccessibility or inadequacy of communications.

It is clear, therefore, that a general improvement of railway services, whether by electrification or other means, would very greatly extend the area that could appropriately be used for industrial purposes, and one or two lines have been indicated where electrification might be undertaken as a means of increasing the population rather than of responding to an existing demand.

Especial interest would seem to attach to the small oases of white occurring in isolation amidst large regions of unsuitable territory. Anyone familiar with farming conditions will be aware how an industrial centre can be a tower of strength to the surrounding agricultural district. In a number of cases, one might even surmise that it would be worth the sacrifice of a certain amount of valuable farming land in order to provide the remainder with a rich industrial market near at hand.

#### FINANCIAL ASPECTS OF RAILWAY ELECTRIFICATION.

Space does not permit a full exposition of the financial advantages of electric traction over steam, and the following figures give only a very imperfect conception of them, many being indirect. For example, the much more even flow of traffic throughout the day, in frequent small units instead of in large units at widely-spaced intervals, facilitates a much more efficient utilisation of station staffs, analogous to the economies of what has been termed "flow production" in industry. Again, the time occupied in calling at a station is greatly reduced, not only by the immensely increased accelerative power of the electric unit, but also because there is a much smaller accumulation of luggage and parcels traffic waiting to be loaded. The whole system thus gains enormously in frequency and flexibility, and the Southern Railway has, in fact, been able to increase its services by nearly 150%, with only a very small increase in total working costs, the additional passenger traffic so obtained being worth some £2 million a year.

In addition to the items listed in the following table, there are also a number of minor savings (enumerated on page 20 of the *Report of the Weir Committee on Main Line Electrification*) on such matters as guards' wages, heating, lighting, and cleaning of trains, insurance, pensions, etc., that would yield a further economy of at least 1d. per train mile.

Disregarding interest on the extra capital expenditure (which would not exceed about 1·6 pence per train mile) the total savings per train mile during 1938 were thus about 1s. 1d., affording an economy in operating expenses of over £2,000,000, as compared with equivalent services run by steam, for the 37,355,073 passenger train miles run that year. Up to that date, the total extra capital outlay was £19,000,000, of which about £11,000,000

HAULAGE COSTS IN PENCE PER TRAIN MILE,  
SOUTHERN RAILWAY, 1938

	Steam.	Electric.	Reduction.
			%
Engine crews and motormen . . . .	10·24	2·11	80
Fuel or electricity . . . . .	7·53	7·64	+1½
Water and lubricants . . . . .	0·58	0·04	93
Stores, miscellaneous . . . . .	0·37	0·03	92
Superintendence of locos. (estimated)	0·39	0·15	62
Maintenance of locos. . . . .	5·71	2·29	60
Electric track equipment . . . . .		0·56	
	24·82	12·82	48

was charged to capital account, so that the saving in operating expenses works out at some 18·2% on the sums so charged, these funds being raised through the Railway Finance Loan at an interest charge of 2¾%. It will be noted, of course, that it would be virtually impossible to operate services of such intensity by means of steam without very costly enlargement of stations, and that, even then, the atmospheric conditions would be deplorable for some distance around.

At this point, it may be pertinent to remark that the railways are so chary of embarking on any fresh capital outlay that they ordinarily require an estimated return of at least 25%. Certain new works on which they have ventured have, indeed, yielded 45% or even 60%. It will be seen, therefore, how rich a field there is for a general reconditioning of the whole railway system with the help of cheap Government loans.

The savings to be effected by electric traction as applied to goods are no less than those obtaining with passenger services. Statistics are not very plentiful; but those derived from American and South African experience indicate that haulage costs can be reduced by about 50%. The percentage return depends on a number of factors, but chiefly, of course, on the volume of traffic conveyed over the electrified track. This circumstance constitutes one of the chief arguments in favour of diverting suitable traffic on to a fundamental trunk system.

The following table indicates roughly the percentage return that might be expected from such a project as compared with a number of other schemes (including the actual conversions on the Southern Railway), for which either actual results have been obtained or else detailed estimates have been made out.

## COMPARATIVE ELECTRIFICATION SCHEMES

	Route mileage (track miles in brackets).	Cost in £ millions.		Trailing ton-miles per single track mile per annum (millions).	Profits estimated as percentage of sums charged to capital account.
		Gross.	Sums chargeable to capital account.		
General conversion (estimates of Weir Committee)	20,000 (35,000)	323·15	260·87	3·1	6·7
* King's Cross to Peterboro'	76 (304)	4·66	2·97	6·95	10·20
* Manchester to Sheffield	41 (152)	2·79	1·44	9·5	15·59
Southern Railway	540† (1,405)	16†	7†	—	12 to 27
Selective electrification proposals	800 (2,000 approx.)	40	20	10 to 20	15 to 20

\* Quoted from *Proceedings of the Institution of Civil Engineers*, Vol. 236, pp. 57 and 76.

† Up to 1937.

‡ Up to 1936.

Particularly interesting and significant is the following quotation from an article, "Best Defence is the Offensive", appearing in the *Railway Age* for 1st November, 1930, and written by a banker named F. J. Lisman:

The Cincinnati & Lake Erie Railway, an electric line in Ohio, has during the last five years, by a careful study and adjustment of its rate structure and schedules, managed to increase its gross earnings about 20% and its net earnings much more. This is in a territory where the steam lines have been losing traffic rapidly!

Certainly, the expenditure adumbrated above does not seem at all excessive, viewed in the light of the huge electrifications carried out on the Continent, where it is possible to undertake a continuous journey of over a thousand miles all under electric traction, and where even an impecunious country such as Spain

is now contemplating the conversion of over 2,000 route-miles of line.

#### THE MODERNISATION OF GOODS TRANSPORT.

Mention has already been made of the inadequacy of British goods services and the cramping effect which this has had on the country's industrial development. The whole question was the subject of most searching analysis in papers read before the Institute of Transport by the Head of the Transport Executive of Unilever House, at Leeds on 10th January, 1939, and in London on 14th October, 1940. Although the recommendations put forward in these papers have since been in some measure adopted by the railway companies, space must be found for a brief account of them in view of the immense importance which transport is therein shown to have in influencing the whole industrial organisation of the country. The necessity thus becomes clear of reaching decisions about the country's future transport policy before other plans are presented in their final form.

Amongst points that cannot be missed is a quotation from Professor Trevelyan, O.M., describing the development of motor transport after the last war as an immense asset to commerce, industry, and even agriculture, and a principal cause why the general standard of life had not fallen as a consequence of that war and the world dislocation of overseas trade.

Motor transport has certain obvious advantages, such as its greatly superior mobility permitting, as was pointed out, the fullest exploitation of geographical advantage and the planning of distribution on a regional rather than a national basis. In one of the biggest schemes of reorganisation which the author of these papers had had to handle in commercial life, it was possible so to reorganise the manipulation of the goods as to eliminate a vast amount of waste movement. But this involved considerable internal reorganisation, and the question arose whether the reductions in the cost of transport would be sufficient to justify such sweeping changes. Actually, after a good deal of negotiation, they were found to be, but only when the railways were confronted with formidable competition from road and combined road and water transport.

Even more than to its superior mobility, the author ascribed the ascendancy of the motor vehicle to its striking facility for obtaining full loads, 300 fully loaded journeys per annum being quite a normal average for an efficiently operated unit. On the other hand, the railway wagon averaged the equivalent of only 56 loaded wagon journeys per annum, with loads much below the capacity of the trucks, viz. :

7.28 tons as the average load for all classes of traffic (average capacity of wagons : 12.01 tons)

2.81 tons per wagon for general merchandise (average capacity of wagons : 10 tons)

From statistics such as these, the author had little difficulty in showing that the actual weight carried by a railway wagon in the course of a year must be something like 5% of its capacity. He therefore deprecated attempts to solve the railway problem by a revised system of rates and charges or by the writing down of capital, when a real solution could be found only in the improvement of operating methods.

The trouble arose from the practice of loading goods wagons at large numbers of stations averaging some three miles apart, dating from the days of the horse-drawn road vehicle with its limited range. The results were to be seen in lightly-loaded wagons, uncertainties and delays regarding the time of delivery (causing much dislocation and loss in industry and forcing traders to store their goods in depots throughout the country), and a multiplicity of costly shunting operations.

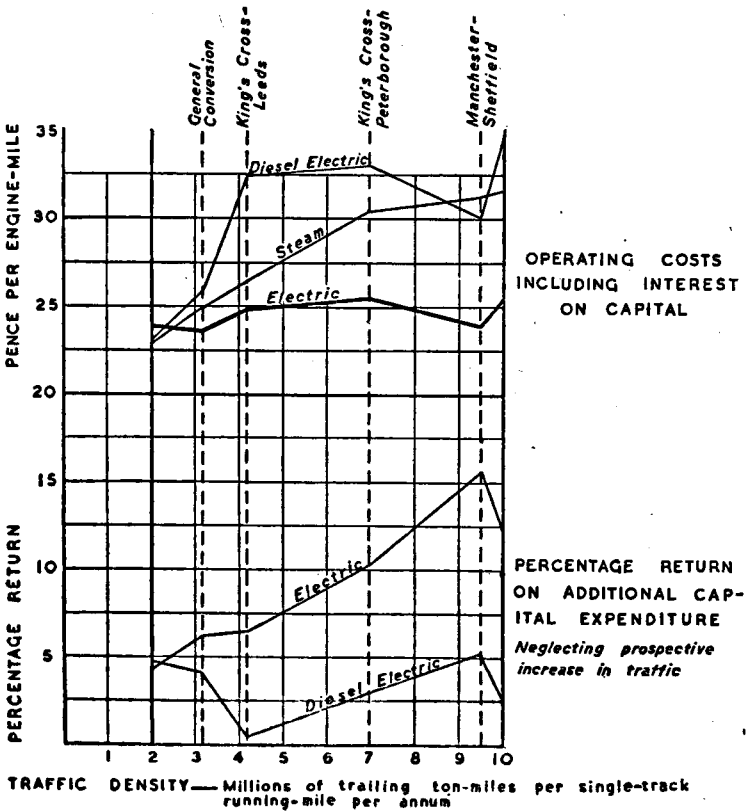
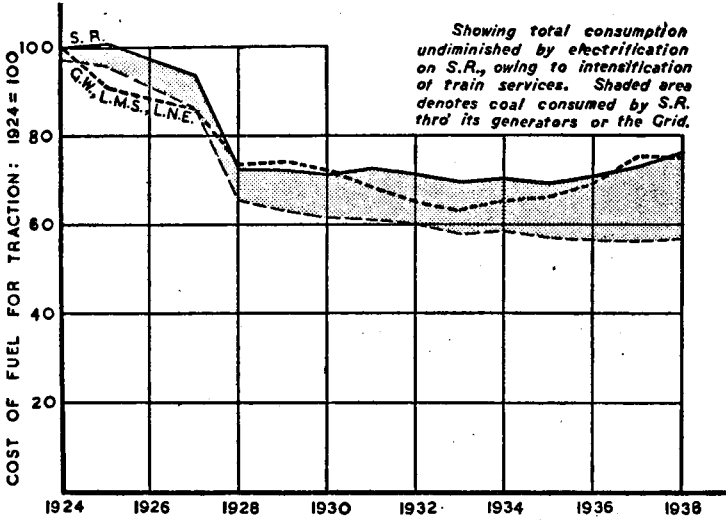
The greatly increased range of the motor vehicle made it possible to concentrate train loading and train movement on certain stations between which full wagon and train loads could be assured without costly transshipping and shunting. By such methods, it was estimated the average load per 10-ton truck could be raised, from under 3, to 9 tons, with an increase also in the number of wagons per train between concentration points. The savings to be effected by such improved technique were estimated at £17,000,000 a year, with a further £13,000,000 from the possibility of using the improved goods services for much of the parcels traffic that at present goes by passenger train. In addition, it was expected that the average goods locomotive could be made to yield at least three times the effective work that it performs to-day, owing to the elimination of shunting and marshalling on the one hand and of local station work on the other.

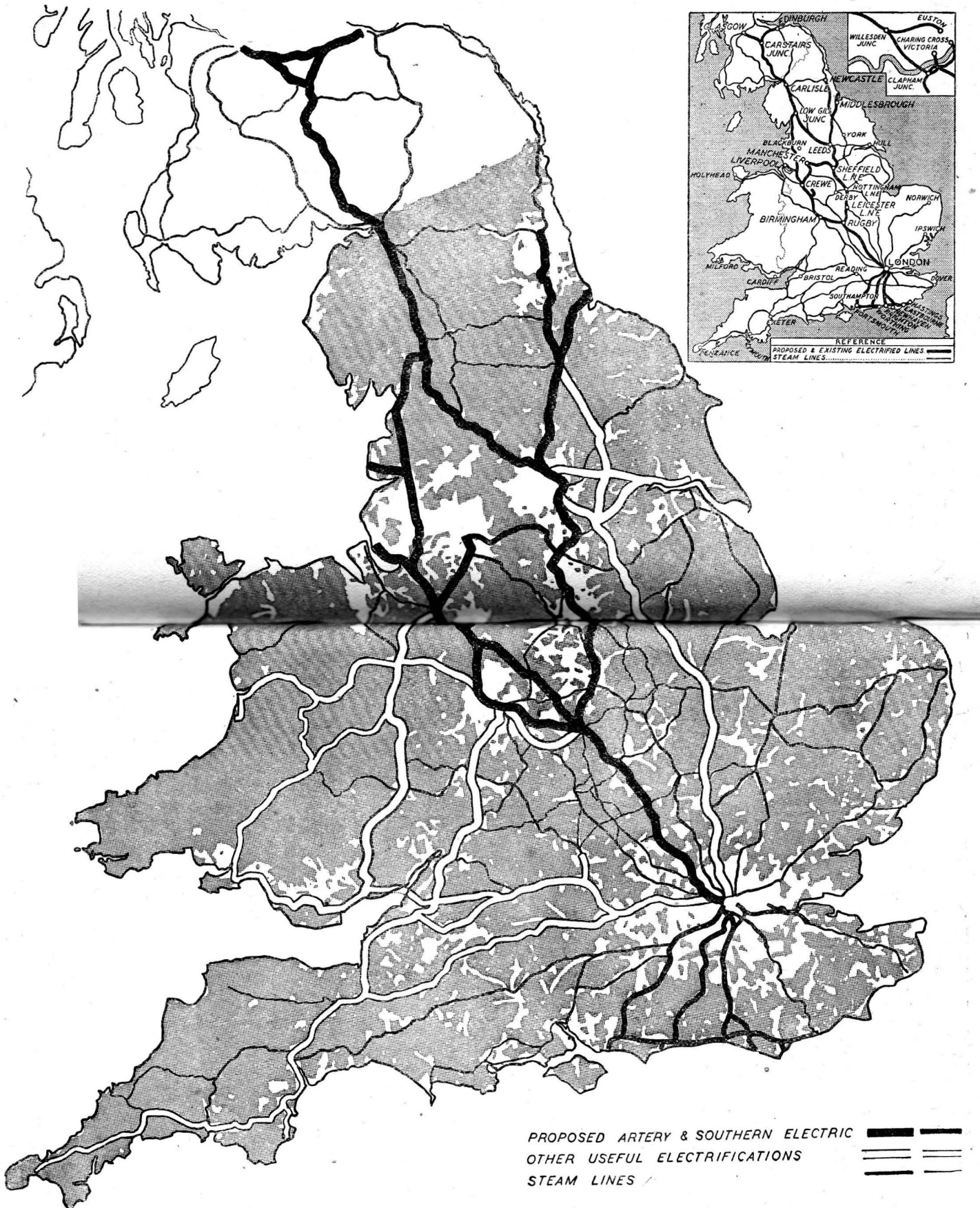
Except for short hauls, there seems little doubt that the combined use of rail and road suggested above would have a permanent advantage over road transport used alone, since transport by road is said to take three times as much power (and transport by air twenty times as much power), weight for weight, as by rail.<sup>1</sup> For a journey of any length, a well-loaded goods train also offers obvious economies in labour as compared with a large number of road vehicles conveying the same aggregate of material.




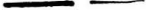


The scheme cannot be discussed in further detail here, except to point out how well it would harmonise with the reservation of certain main lines for certain classes of traffic, whereby the

<sup>1</sup> Lomonosoff, *Introduction to Railway Mechanics*.

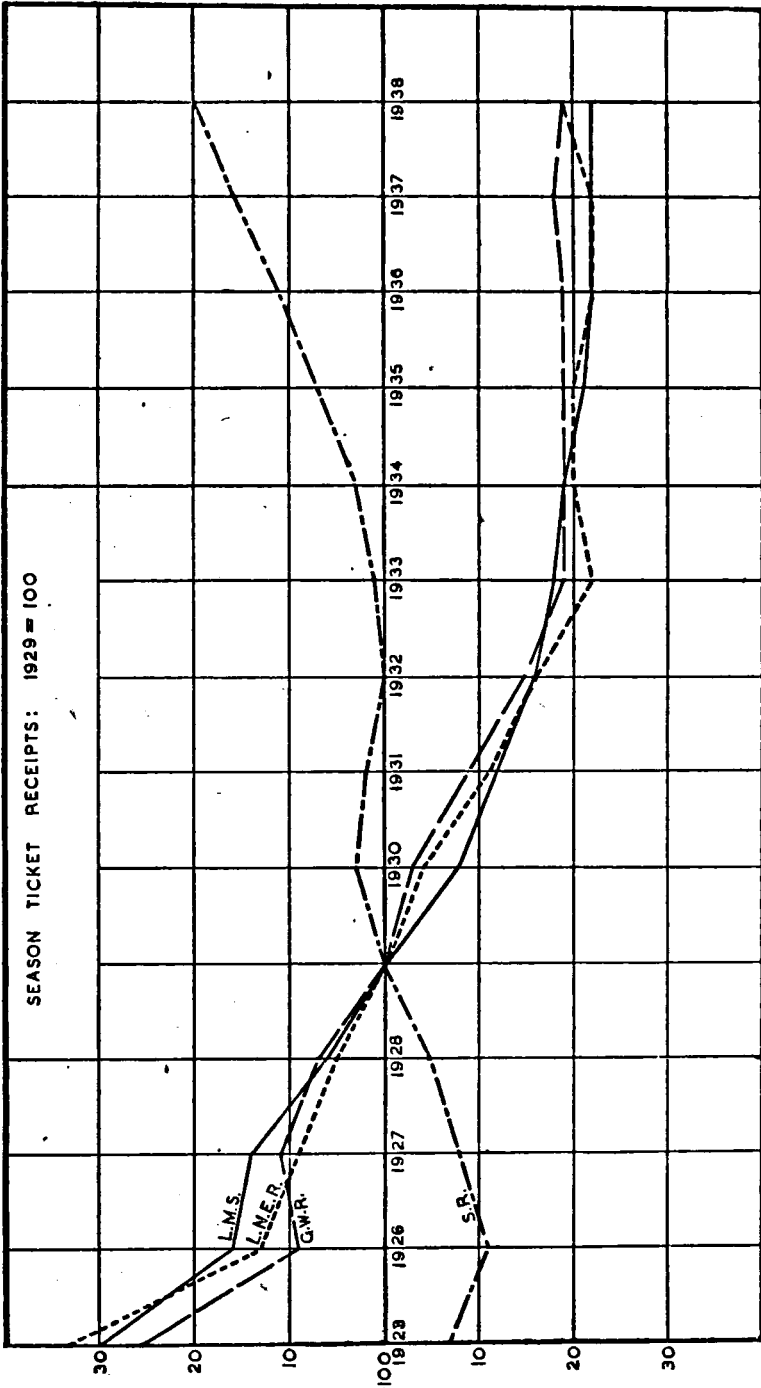
### EFFECT ON COAL TRADE





PROPOSED ARTERY & SOUTHERN ELECTRIC    
 OTHER USEFUL ELECTRIFICATIONS    
 STEAM LINES  





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formation of adequate loads on the steam-operated routes would be made much easier than under a continuance of the present semi-competitive system.

What precise points should be chosen for the proposed concentration stations need not be considered here. For it is obviously better that they should be selected to fit in with other requirements of the Demographic Plan, so far as the location of existing railway lines permits, rather than that the Plan should be distorted to fit in with certain arbitrarily chosen concentration points.

Once again, emphasis must be given to the need for early consideration if full advantage is to be taken of the approaching opportunity. After the last war, large numbers of Service lorries were bought up cheaply by demobilised men, forming the nucleus of the road transport system which then grew up. Similar enterprise on the part of the railways at the end of the present hostilities might easily give them a new prosperity and value to the State.

#### POSSIBILITIES OF EXTENSION AND SOCIAL EFFECTS.

Transport enters so intimately into every activity of life that the present Memorandum would be incomplete without some fuller review of the wider social and economic aspects of railway electrification than has been possible in previous sections. It is desirable, also, to give some indication as to how far electrification could be used to promote the spread of population into new areas, as opposed to primarily meeting the needs of existing towns. That the subject is one of paramount importance in any scheme of national reconstruction is clear beyond all doubt. Unless the dwellers in the new settlements have cheap and rapid communications with the great cities and with their former circles of acquaintances, they are more than likely to feel cut off and ill-at-ease, and may, indeed, be very loath to move into the new surroundings, however attractive these may be made. A general increase of travel and interchange of outlook would, moreover, be of great educational value to the community.

The keynote of all electric equipment is its flexibility—a quality needed all through in an industrial system that may have to adapt itself to all sorts of changing and incalculable conditions. For reasons already given, a growing district situated on an electrified line linking large cities could be afforded services adequate to hasten its further growth long before such facilities could be provided by steam. How far it would be justifiable to provide electric traction on some lightly-worked line primarily to attract population that way is a more debatable matter, since much could be done in the first instance by steam or oil-electric traction :

moreover, the need for smoke abatement would be much less pressing.

Along the electric artery advocated above, many new settlements could appropriately be established. Other busy lines passing through sparsely-populated and suitable areas would seem to include those from Paddington to Penzance and from King's Cross to Leeds. Within a few years it seems probable that electrification will have spread to at least three of the main lines running from London to the North. But the process must necessarily be a somewhat gradual one if it is to be synchronised with the obsolescence of existing steam equipment.

The immense flexibility of electric services would undoubtedly foster progress of all kinds. The addition of a single train a day between London and Great Bookham caused an immediate advance there of £50 an acre in the price of building sites, and land values have gone up by leaps and bounds at any point between New York and Washington that could conceivably be termed "main-line". Even under drastic restrictions against the random placing of new buildings, the proposed artery or, indeed, railway electrification of any kind would clearly afford a sovereign means of promoting housing and industrial developments, with consequent reduction of the State subvention required for such ends.

The high speeds would open up a whole range of long-distance suburban possibilities. From some midway residential point, access could be provided in little over half an hour either to the amenities of London or to business activities in Leicester or Birmingham; whilst the South Coast could be made a suburb of the Midlands.

Especial importance seems to attach to the possibility of providing evacuees and demobilised men—of whom many may wish to continue with an open-air life—with new residential centres from which agricultural and industrial pursuits could be combined on a part-time basis. It is not merely that the volume of industrial work may be greatly curtailed after the war and that it would be more equitable to share it out than to confine what is available to a favoured section of the population. No less insistent are the psychological and demographic aspects of the matter under the modern conditions, in which factory work is becoming more and more soulless and mechanical; in which, too, the family that is confined to the large town and receives no fresh blood from the country is generally extinguished after three generations. With a dwindling population, clearly nothing that is conducive to mental or physical well-being or to national survival should be left undone. It seems possible that workers pursuing two different means of livelihood might come to possess

advantages analogous to those attributed to people who are bilingual, and the monotony of everyday work would be much reduced. It would be easier, too, to counteract the effects of a falling export trade if the population were distributed with a view to increasing the country's home-grown food supply. But good communications are likely to be a prerequisite of success for any such scheme.

Space does not permit enumeration of the many other advantages that electrification would bring. Perhaps one may close with a reference to the way in which the influx of suburban dwellers to the big cities in the morning would create an outward stream of half-empty trains that could be used to take children out to school in the country.

Clearly, the whole subject is one that calls for searching investigation at the earliest date if a golden opportunity is not to be missed. So long as a decision in such a vital matter is withheld, there must exist a disabling lack of definition or finality in the many other schemes now being prepared.

# ELECTRICAL PLANNING FOR GREAT BRITAIN

by

J. R. BEARD, M.Sc.,

PRESIDENT OF THE INSTITUTION OF ELECTRICAL ENGINEERS<sup>1</sup>

THERE can be few among us who do not feel that some improvement of organisation is essential in the electricity supply industry—although there is naturally some divergence of opinion as to the form it should take. I would, however, urge that the need for initiating action should be accepted by all concerned and that we should make up our own minds as to what should be done. We must not again, as has happened in the past, wait until a scheme is sought to be imposed upon us from outside and then exhibit to the world a picture of diverse interests whose main concern seems to be the preservation of sectional rights and privileges.

To avoid this, a small "Planning Council for Electricity Supply" might well be set up voluntarily by the industry itself on a representative basis (possibly with an independent chairman chosen by themselves), the members being vested by the different interests with full authority to hammer out a mutually acceptable scheme, which could then be presented to the Government for any necessary legislative enactment.

In our membership we have men concerned with all branches of the industry who have knowledge of its weaknesses as well as of its possibilities. I suggest that they have a great opportunity to take the initiative in forming such a Planning Council on the basis of sinking sectional interests and planning for the good of the whole. Its members would only reach an agreed scheme by a process of adjustment involving "give" as well as "take"; but surely it would be worth while to give freely in order to avoid allowing our future to become the sport of party politics and the experimental ground of doctrinaire enthusiasts. A well-considered scheme, with the full weight of the electricity supply industry behind it, could not be ignored by the Government and would probably be welcomed as a speedy means of settling one of the post-war problems, thus clearing the ground for the settlement of others equally urgent.

In putting forward some considerations which might be taken as the basis of such a scheme I must, of course, do so in a personal capacity and not as representing the considered views of The

<sup>1</sup> Extract from the Inaugural Address delivered before the Institution of Electrical Engineers, 1940. With kind permission of the Institution.

Institution or of any branch of our profession. Nor should my suggestions commit me irrevocably, for we all should approach a discussion such as I envisage with minds open to conviction and compromise ; but I am convinced that now is the time to discuss such future planning freely, openly and frankly. Members may not agree with some of my suggestions, but I hope all will give me credit for trying to take that broad impartial view which is the only view your President is free to take.

From what I have already said it will have been evident that I am not one of those who wish to see set up a vast nationalised organisation, but I recognise at the same time that certain aspects of electricity supply must be planned nationally if we are to secure the highest efficiency. I equally recognise that efficiency is not necessarily to be achieved by rigid ideas of ultra-uniformity and symmetry of structure or merely by magnitude of organisation. No one questions that such services as the telephone or broadcasting are best organised on a national basis, because there is one uniform requirement to be fulfilled and what is done in one part of the country inevitably affects those throughout the country for whom the service is provided. Even so, some measure of decentralisation has been proved to be essential to efficiency, and we have all seen the beneficial effects of the adoption of this policy in the Post Office and certain other national services.

It will also have been clear that I am not one of those who feel that there is something fundamentally wrong in any trace of the profit motive being retained in the provision of a public service, provided that it is accompanied by adequate safeguards. With these guiding principles in mind we can now proceed to consider the matter in more detail.

The criterion of the successful provision of any public service is that the consumer can get what he requires in quality and quantity at the lowest possible price. As electricity supply is a public service which, if it is to be efficient, must be operated on a monopolistic basis it follows that it must be subject to a substantial measure of supervision by the State in the interests of the public. Such supervision must form part of any scheme of improved organisation.

The industry itself has tended more and more to divide into two parts, one dealing with generation and transmission in bulk and the other with the actual distribution to the ultimate consumers. This division has assumed a very definite character since the Central Electricity Board was set up and has become responsible for bulk supplies to all distributing authorities. It is therefore convenient to consider these two sections of the industry separately. Any scheme will accordingly divide naturally into three parts—national supervision, generation, and distribution.

## NATIONAL SUPERVISION

Immediately after the 1914-18 war the Electricity Commissioners were established to promote, regulate and supervise electricity supply. To those who remember the confused situation in the early days the improvement which has thereby been effected must seem very great. It is of interest to note that the Government adopted a new technique of control; in place of a department of the Civil Service they set up an independent body which, though organised largely on civil service lines and responsible to the Minister of Transport, retains a certain measure of independence and is a direct charge on the industry it controls. This has resulted in placing on the Commission a certain obligation to consider the point of view of the industry in so far as this does not clash with the interests of the public. After more than 20 years' experience, it is desirable to review the powers and duties of the Commissioners in the light of the changed conditions which have developed, and it will not be out of place to consider broadly what part they should play in the future.

The Commissioners are, and should remain, a technical-judicial body entrusted with the oversight of the electrical requirements of the general public and of the relations of the activities of electrical undertakings with each other and with the community. The implications of these functions are very extensive and it may be useful to attempt a summary of them. The duties of the Electricity Commissioners would seem to be:

- (1) To advise and guide the Government on all legislation affecting the industry and to endeavour to ensure that their advice is implemented.
- (2) To ensure that, so far as reasonably practicable, electricity is available to all and at the lowest possible price.
- (3) To ensure that it is available in the form required, which, in general, means alternating current at 50 cycles per second at a standard voltage.
- (4) To ensure that it is supplied at a price which is fair as between different classes of consumer and on a form of tariff which is generally acceptable and understandable.
- (5) To impose regulations on electricity supply undertakings to ensure that in carrying out any works they do not create any undue danger or nuisance to the public.
- (6) To arbitrate between the public and the industry in all matters where it has been found essential for the Government to grant compulsory powers to supply authorities, so that the general good of the community shall not be hampered by unreasonable obstruction from sectional

interests. This, in practice, means principally questions of wayleaves and the purchase of land.

- (7) To approve the forms of constitution and spheres of operation of supply authorities. The forms of constitution include all financial safeguards necessary for a continuing monopoly, such as the methods of raising capital, scale of depreciation and limitation of dividends.
- (8) To supervise the activities of such authorities in order to see that they carry out their duties in accordance with their powers.
- (9) To arbitrate on matters in dispute between supply authorities.
- (10) To record and study the results of the operations of the supply authorities and to make public comment on the efficiency of the services they perform.
- (11) To make grants for research and development in matters which are accepted as of general interest to the industry as a whole but which, for one reason or another, cannot conveniently be organised by the supply authorities themselves.

These duties cover such a wide field and the Commissioners' powers of ultimate control are so great that it is most desirable that they should continue to leave to the various supply authorities wide freedom of planning and initiative in the operation and extension of their undertakings. Nevertheless, in any future planning of the industry it may be desirable that the interpretation of these duties should be clarified in certain respects, greater emphasis being placed on some than has been the case hitherto and, perhaps, less emphasis on certain others. These points are most conveniently dealt with in detail when I come to consider generation and distribution respectively.

#### GENERATION

The experience of the 1914-18 war, which resulted in the formation of the Electricity Commissioners, also showed the importance, for reasons both of efficiency and also of security, of planning generation for much more extensive areas and loads than those of most of the existing supply authorities. Such a policy had been advocated in this country for many years by engineers with vision and was being increasingly adopted abroad. Its adoption in Great Britain had been frustrated by antiquated legislation and local jealousies, and one of the primary duties originally laid down for the Electricity Commissioners was to remedy this state of affairs by setting up Joint Electricity Authori-



ties on a public ownership basis to deal with generation over wide areas.

Public opinion, however, was not ready for such a wholesale transfer of an important section of an industry to public ownership, particularly as it would have had to be done in defiance of the general wishes of many of its leaders. In consequence, Parliament would not grant compulsory powers and the Commissioners found it impossible to carry out such a policy by voluntary means. From a purely technical standpoint this may have been unfortunate, but, looking back over the intervening years, it is evident that the technique of public ownership was then inadequately developed and that had such bodies been formed compulsorily their structure would have been clumsy and inefficient.

It soon became evident that the efficiency of the industry was suffering to an increasing extent from the chaotic state of its generating methods and that some action was essential. In 1925, therefore, a fresh attempt was made to solve the problem by the Weir Committee. The technical development of the industry in the intervening years had, however, shown that maximum efficiency of generation required planning on a national rather than regional basis, and this new development was recognised by that Committee. Their main recommendation was that a Central Electricity Board should be formed to organise generation for the whole country. This was carried into effect by the 1926 Act, which forms a landmark in the development of all forms of public enterprise. It has given the country valuable guidance in working out what has, so far, proved to be the best constitution for a type of organisation which was increasing in number and importance before the war and is likely to play a still more important part in the future.

The Central Electricity Board as planned by the Weir Committee has shown itself to combine in a marked degree the best features of both public and private ownership. This is mainly due to the Board having been allowed to manage its finance and administration in comparative freedom from external control, but an important contributing factor to the success which has been achieved is the personal one. Most previous bodies of this character had a large membership formed of representatives of all the numerous interests which were directly, or even indirectly, affected and the individual members frequently served for very limited periods. The Central Electricity Board, on the other hand, is a compact body of only eight members appointed for definite extensive periods and formed of members carefully chosen by the Government for specific qualifications of a completely non-political character. It is no doubt due to these reasons that

the members of the Board have worked together in a true team spirit and, by remunerating the executive staff in a manner comparable with that current in industrial undertakings, have been able to draw on the highest administrative, technical and commercial experience available.

The first duty of the Board was the construction of the Grid. On the purely technical side the result of the intensive work put into the design and construction of the Grid has proved most successful, not only in its actual application in this country but in its indirect effect on the standing of British engineering construction and operation throughout the world. It has also aided our manufacturing industry in extending and consolidating the engineering export trade with the Dominions and other parts of the world in successful competition with manufacturing firms of other countries possessing highly developed electrical industries.

It is not necessary to refer in detail to the activities of the Board, as these are already well known to our members, and its technical achievements were dealt with very completely in Mr. Johnstone Wright's Presidential Address last year.<sup>1</sup> For the purpose now in view it is only necessary to give some consideration to certain specific points which must be borne in mind in any future planning of the industry.

At the time of its formation the Weir Committee had the difficult task of devising an organisation which could reasonably be expected to achieve the efficiency to be obtained by national planning and control of generation, without unduly interfering with the existing supply authorities who had borne the brunt of the early development of the industry and had incurred large commitments under the protection of statutory rights and privileges. Accordingly, certain important restrictions were placed on the Central Electricity Board's powers. Some of these were relaxed by the 1935 Act, but others that require reconsideration in the light of experience are the following:

(1) The Board is prohibited from owning or operating generating stations save in very exceptional circumstances.

(2) The Board is placed under a statutory obligation that the cost of electricity supplied by it in any year to any owner of a selected station shall not exceed what the cost of independent generation would have been had the Board not been in existence.

(3) Being a new and untried body the Board was, quite naturally, made subject to a considerable measure of technical control by the existing Electricity Commissioners, even on comparatively detailed matters.

On the other hand the Board were given certain powers which

<sup>1</sup> *Journal I.E.E.*, 1940, Vol. 86, p. 1.

may also require reconsideration in the light of experience, of which two may be mentioned :

(4) If the owner of a selected station takes his supply from the Board on the basis of what it would have cost him under independent generation, he obtains no return for the use which the Board may make of his station for providing energy to the Grid.

(5) The Board is only under obligation to give supply at a single point to any supply authority, however large and however extensive its area, except in so far as the supply authority may have more than one selected station.

I now propose to consider briefly what changes may be desirable in connection with each of these matters.

(1) In very few instances is the output of a generating station completely absorbed by its owner. It is provided and planned for a much wider area and may even, in certain circumstances, be giving supplies 50 to 100 miles away. The location of new generating plant is already planned by the Central Electricity Board, which is also responsible for repaying all operating costs—including capital charges—and for directing the method of operating the plant as regards both output and efficiency. The owner is therefore in the peculiar position of having no responsibility other than providing the capital—on excellent security—and providing the staff for designing and supervising construction and for operation. Hence, in most cases, the owner is only acting as an agent for the Board and gets no direct reward for his work. It may be asked whether, in these circumstances, it would not be better that the Board itself should own and operate all generating plant; if this were likely to result in appreciable economy, it should undoubtedly be done. Such a vast increase in the Board's responsibilities would, however, mean radical change and expansion of staff, would absorb a large amount of the Board's administrative and technical capacity, and would necessitate large regional sub-organisations which would have to be staffed and administered by the personnel of the existing supply authorities. It is therefore probable that any theoretical improvement in economy would be outweighed by the effects of the resulting dislocation and that the balance of advantage is in favour of retaining the present procedure. There are, however, two modifications which are desirable.

(a) The Board might reasonably be required to make the owner some payment for the responsibilities imposed upon him. This could be in such a form as to give the owner a direct incentive to economy, both in capital and in operating costs. The procedure would require detailed consideration, but, as a basis, it might be possible to agree in advance the cost of production to be expected, divided into a fixed kilowatt charge and a unit charge, and to pay

the owner a proportion of any saving effected during actual operation in either or both of these items.

(b) The Board itself should have power to build and operate a station at any point where it was technically desirable to place it, provided the Board could satisfy the Commissioners that the supply authority in whose area the station would be situated had not the experience and personnel to organise an undertaking of such magnitude. Some action in this direction has recently been taken, but only as a war-time measure.

(2) The present arrangement, under which the energy sold by the Board to most of the larger supply authorities is charged on the basis of what it would have cost them to generate their own requirements had the Board not been in existence, is increasingly unsound. It involves estimates, on highly hypothetical grounds, of load forecasts, technical developments and cost, which would be difficult enough if related to recent actual experience, but become almost fantastic as the years pass on. It is a tribute to the staffs of these undertakings and of the Board that, so far, these negotiations, involving very large sums of money, have been found capable of a mutually satisfactory solution; but all parties realise that sooner or later some modified arrangement must be substituted. The present arrangement is, in effect, a cumbersome procedure for settling the minimum reduction in the Grid tariffs necessary for the supply to large undertakings. One logical modification of it which has been suggested would take the form of fixed permanent discounts, on the standard Grid tariffs, of an amount such that if the tariffs (with discounts) were applied to the last few years on which agreements on the charges had been reached the charges would have been the same in total. This would not only provide a direct and simple basis of charge but would also have the advantage of enabling the larger undertakings to share in the general economies produced by the Board's operations when the time arrives for existing Grid tariffs to be reviewed.

(3) Now that the Board is fully established and has all the necessary facilities and data for planning its own growth, it appears unnecessarily cumbersome to retain the procedure under which all extensions have to be the subject of formal schemes prepared by the Commissioners, published by the Board and adopted by them after due opportunity for representations. It should be sufficient for most extensions to the Grid to be carried out under such formal approval by the Commissioners as is normally given to the extensions of authorised undertakers.

(4) An understandable grievance is felt by many of the larger undertakings because they do much to assist the Board's operations but receive no share in the savings these effect. It results from

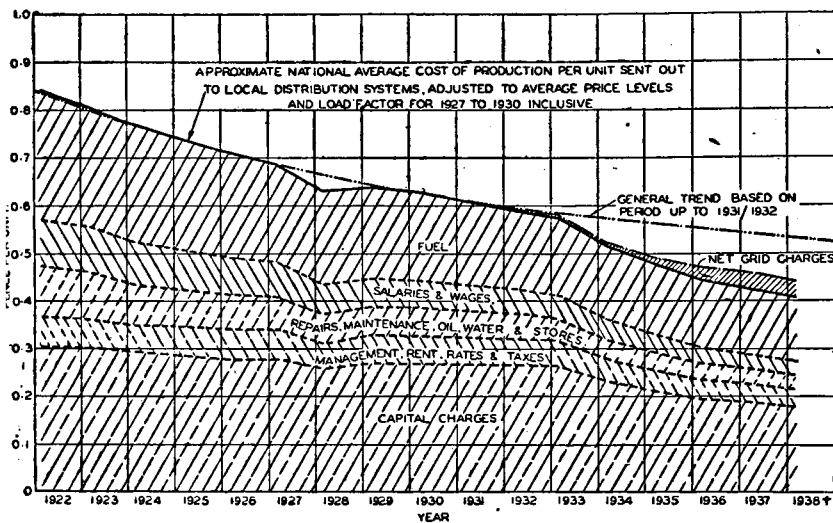
the Board's statutory obligation to base its charges on defined methods of charge, which are generally applicable to certain classes of undertaking. This automatically makes it impossible to divide the savings evenly over all undertakings and, in consequence, some undertakings make very appreciable savings from taking the Board's supply while others make quite small savings or none at all. The Board has, very properly, interpreted its primary duty as being to make cheap electricity as widely available as possible and to extend the Grid to link up with all undertakings throughout the country. This has now been done and a stage is being reached at which the total saving effected will be more than that which it has been necessary to pass on to the smaller undertakings in order to make possible the Board's policy of general availability. When this stage arrives, the larger undertakings have, undoubtedly, a first claim on part of any surplus, in recognition of the assistance which they have given hitherto, without direct financial benefit to themselves, towards the reduction of electricity costs in the country as a whole. The suggestions already referred to under (2) would seem to provide a method of giving effect to this justifiable claim and, in some instances, would be supplemented by the suggestion under (1). Even though any actual benefits might still lie somewhat in the future, the mere fact of ensuring that they would eventually mature would do much to meet the grievance of the larger undertakings and to justify early action in defining the method under which the right to them would be secured in advance.

(5) The original limitation of the Board's obligations to the provision of one point of supply to each supply authority was intended to prevent supply authorities from using the Grid system to take the place of their own transmission and distribution systems without cost to themselves. On the other hand it is uneconomic for them to have to incur the expense of transmission if it could be done more cheaply by making use of the Grid. The Board has, voluntarily, made arrangements in several instances for such use, but it would clearly conduce to maximum overall economy if the Board were put under an obligation to sub-divide the supply without extra cost and to give it at as many points as a supply authority might require, provided that the Board were entitled to charge to the supply authority all additional capital and operating costs incurred through the provision of the additional points of supply.

No doubt other matters would be brought out in any general investigation into the future planning of the generation side of the electricity supply industry, but those mentioned are sufficient to indicate that the time is appropriate for such a review of the situation, even although it is generally admitted that this side of

the industry is in good shape and less in need of drastic action than the distribution side.

Fig. 1, reproduced from the Board's Eleventh Annual Report, gives ocular evidence of the substantial economy so far achieved by the national planning of generation. It shows that by 1937-8 the average cost of generating a unit—after taking full account of the capital and other charges of the Grid—had been reduced to seven-eighths of what might have been expected under unco-ordinated development. This reduction corresponds to a present annual saving of some £9 million, all of which is being transmitted to the ultimate consumer. Unfortunately its effect is being



† PROVISIONAL

FIG. 1.

masked during recent years by the spectacular rise in the price of the chief raw material—coal; a rise due to causes quite outside the control of the electricity supply industry. Had it not been for the co-ordination of generation this increase in the price of coal would already have necessitated much larger increases in electricity prices:

Apart from monetary saving, national planning of generation has benefited the ultimate consumer by the resulting increased availability of supply. This has also benefited the nation in its war effort, to which must be added the lessened danger from air attack owing to the elimination of the dependence of industrial plants on individual power stations. It should, however, be realised by everyone, including certain Government Departments, that co-ordination of generation cannot substantially increase the

total amount of power available throughout the country; it cannot, in short, produce a quart out of a pint pot and has not removed the vital necessity for planning generating-plant extensions in sufficient time to deal with increased demand. Generating plants are expensive and complicated, often requiring as much expenditure as the factories they supply and taking longer to construct. Without their outputs of power the factories cannot produce their outputs of munitions.

#### DISTRIBUTION

When we turn to the distribution side of the industry we see a different picture—the equivalent of a patchwork quilt or a crazy pavement. No substantial measure of national, or even regional, planning has been introduced, and it is here that our most intensive post-war effort will be required. Appreciation that such a problem exists was shown by the appointment of the McGowan Committee in 1935; but even the relatively mild proposals which they made were not implemented by the Government, largely because of the threat of considerable opposition from certain sections of the industry.

The industry exists for the benefit of the ultimate consumer, who is not in the least concerned with its internal structure or with its technical details. He is only interested in being able to purchase his electricity in the form he requires, wherever he wants it, at the cheapest possible price and on a fair and simple basis. All four of his requirements can be met more efficiently than at present by some degree of national planning, but this must be combined with regional planning, as it is impracticable to contemplate the present 9 million consumers—and the prospective 12 million—being directly dealt with other than through regional bodies in close touch with local conditions.

The national planning side should be the work of the Electricity Commissioners, who must co-ordinate and guide the broad basis of the regional planning. Such planning by the Commissioners is essential if they are to carry out adequately those main duties which have been suggested earlier, and I would urge that they should devote to it an even greater proportion of their energies than they have done hitherto without being discouraged or deterred by difficulties experienced in the past. The need for planning distribution is widely accepted by the industry, although differences of opinion exist as to the actual steps to be taken. The time to make a renewed attempt to arrive at a final and equitable solution in advance of, rather than behind, the inevitable pressure of public opinion is *now*, so that a beginning can be made with the resulting construction work immediately after the war.

I propose to limit consideration of the planning which is

required to that section of distribution which is concerned with the supply of current at low voltage for lighting, heating and cooking. I do so not because this is the most important section—although it is of great importance—but because it directly affects the general public, is admittedly in an unsatisfactory position and is the most likely to be the subject of public criticism. Industrial users are, on the whole, reasonably satisfied with the services of the supply authorities and, in any case, developments planned to improve the supply of lighting, heating and cooking will automatically improve the supply of power. It is convenient to consider these developments under the four requirements of the consumer already mentioned.

#### TYPE OF CURRENT AND VOLTAGE OF SUPPLY.

The enormous growth of portable appliances and the ubiquitous wireless set have given this matter national importance, as has also the increased mobility of the population as the country has become more highly industrialised.

The question of the type of current, over which the giants battled in the youthful years of The Institution, has long been settled in favour of alternating current, though the dust of the conflict is still with us despite the extensive conversions which have been made in recent years. The latest published position (1937-8) is summarised in Table 2, and the comparative figures for 1926-7 indicate the substantial progress over eleven years.

In 1937-8 the number of consumers supplied with alternating current was 8·24 millions, whereas the number supplied with direct current was only 1·12 millions.

It is obviously desirable that the complete elimination of direct current should be achieved as quickly as possible. As a rule it is in the interests of the supply authority to carry out the change-over because it results in greater efficiency of distribution and lower capital cost of meeting future loads. Delay in so doing is usually due either to lack of initiative or to unwillingness to expend capital. Where the latter is due to uncertainty of tenure of company undertakings it is understandable and is a strong reason for eliminating such uncertainty. Subject to this it would not seem unreasonable for alternating current to be made compulsory for domestic consumers after a strictly limited interval, possibly with some provision for grants from a central fund in exceptional instances.

Almost equally important to the consumer is the question of standardised voltage. The standard is now agreed as 230 volts, and the only difficulty is the cost of standardising the non-standard systems. Fifteen years ago 50 cycles per second was equally accepted as the standard of frequency, but national standardisa-



TABLE 2

	Number of authorities supplying.		Millions of units sold for lighting, heating and cooking.	
	1937-8	1926-7	1937-8	1926-7
Alternating current alone . . . . .	298	177	2,247	301
Direct current alone . . . . .	29	184	16	79
Both alternating current and direct current . . . . .	267	234	5,085*	1,063*
Total . . . . .	594	595	7,348	1,443

\* These figures cannot be segregated between alternating current and direct current, but the larger proportion is probably alternating current and is increasing.

tion of frequency seemed to many an impracticable ideal. Sir John Snell thought otherwise and by a bold policy he achieved it. Who would say to-day that his policy was wrong? Criticism is directed, rather, against its increased cost owing to the delay in undertaking it. An equally bold policy is now required in voltage standardisation. Our Institution thought so seriously of the matter in 1927 that the Council decided to investigate it. The Committee appointed for this purpose had the full assistance of the Electricity Commissioners, who made a special examination of the position as it then was. On the conclusion of the Committee's work the Council approved the publication of their Report,<sup>1</sup> which indicated that the cost of standardising voltages below 220 volts might range from £10 million to £16 million, and above 240 volts would be about 10% of these amounts. These figures corresponded to between 9½% and 15% of the then capital expenditure on distribution. This Report is well worth re-study to-day. Table 3 shows the proportion of the lighting connections at different voltages as this special examination showed it to be in 1926-7, and no more recent figures are available for comparison.

Figures are available, however, of the numbers of undertakings giving a supply at various voltages, and these are shown in Table 4 for 1926-7 and 1937-8.

In considering this Table it is necessary to remember that many undertakings give supplies at different voltages in different parts of their area and are therefore included more than once. The figures show a substantial advance in standardisation, but in the meanwhile the capital expenditure on distribution has been con-

<sup>1</sup> *Journal I.E.E.*, 1930, Vol. 68, p. 516.

tinually rising. In 1926-7 it was £117 million and in 1937-8 £294 million. No doubt a large proportion of the new expenditure has been incurred on standard systems, and therefore the cost of voltage standardisation to-day will be a smaller percentage of

TABLE 3. PERCENTAGE OF CONNECTED LIGHTING LOAD AT VARIOUS VOLTAGES, 1926-7

230 V (standard).	Below 200 V.	Range 200-215 V.	Range 220-240 V. (excluding 230 V.)	Above 240 V.
22	4	37½	32	4½

the present capital expenditure on distribution. Nevertheless, it would almost certainly be greater in total than in 1927 and, to this extent, delay has increased the cost as it did in frequency standardisation.

In the last year for which statistics are available, figures are included for the first time of the number of consumers taking their supply at various voltages. These are given in Table 5, and the trend of these figures in later years will be of great interest. They show that in 1937-8 the total number of consumers supplied at the standard voltage had risen to just over one-half.

Some two years ago the Electricity Commissioners decided to take some action on voltage standardisation, but owing to various reasons their plans were shelved. They should be taken down from the shelf in sufficient time for the expenditure which would result to be usefully made in the disturbed period which must inevitably accompany the transition of industry to

TABLE 4. NUMBER OF UNDERTAKINGS SUPPLYING AT VARIOUS VOLTAGES

Voltage.	1926-7.		1937-8.	
	A.C.	D.C.	A.C.	D.C.
100 . . .	40	6	19	3
200 . . .	69	39	59	23
210 . . .	15	24	13	15
220 . . .	45	91	26	56
230 . . .	168	133	437	114
240 . . .	73	80	63	46
250 . . .	44	18	49	16

peace conditions. Voltage standardisation would then parallel the rôle which the Grid fulfilled during the world economic crisis. If it is to do so, it must be planned before the transition period arrives. We must not let ourselves be deterred by the magnitude of the expenditure involved; it is quite comparable with that of frequency standardisation and of even more direct importance to the public. Arguments against standardisation would have more weight if the industry had ceased to expand, but we all have faith in its growth, and further delay can only increase the cost owing to the continuous growth of non-standard systems.

How is such standardisation to be financed? The simple and direct method of a levy by the Commissioners on the whole industry was adopted for frequency standardisation, but it is arguable that the direct gain to the individual undertaking is greater with voltage standardisation. It may therefore be felt that only a portion of the cost should be met by a general levy, the remainder being met by the undertaking carrying out the standardisation. Special treatment might be thought desirable for those undertakings whose present voltage is above the standard and who therefore stand to gain less. For them the proportion met from the levy might be greater. Standardisation should

TABLE 5. CONSUMERS AND SUPPLY VOLTAGES, 1937-8

Voltage.	A.C. consumers.	D.C. consumers.
	(Thousands)	(Thousands)
200 . . . . .	1,341	98
205 . . . . .	126	7
210 . . . . .	242	40
220 . . . . .	310	228
230 . . . . .	4,411	379
240 . . . . .	947	274
250 . . . . .	765	79
Other and unaccounted for . . . . .	99	12
	8,241	1,117

preferably be compulsory, but an alternative would be to make the contribution from the levy progressively less the longer standardisation was delayed.

#### AVAILABILITY.

Few would question that a supply of electricity has become a necessity of modern life; but large sections of the population in rural areas and in the older industrial areas are still unable

to obtain a supply, though great progress has undoubtedly been made. The difficulty arises from the length of the educational period which is necessary before the demand in such areas can reach a scale that provides a remunerative return on the capital which has to be invested. But, being a monopolistic service, a public duty devolves on the supply authorities to adopt a sufficiently advanced policy to make their supply available everywhere, even if by so doing there is, temporarily, the equivalent of some subsidising of the smaller and outlying consumers by the larger and more fortunately situated ones. This has been accepted without question in such fields as postal services, transport, water supply and others, in which it is perhaps more immediately patent that the service is a necessity for all in the interests of all.

Many supply authorities have accepted this public duty willingly, but if the whole population is to receive adequate service, some modification is required in the existing obligation upon supply authorities to connect consumers. Possibly some limitation might be placed on tariff reductions in developed areas, unless it could be shown that the policy of the supply authority was based on providing general availability at an early date. This, however, might prove difficult to work. A more direct method would be to make general availability compulsory within a limited period, and this could be made to provide further useful construction work during the difficult period to be anticipated after the war. Any supply authority unwilling or incapable of meeting this requirement might then be automatically transferred to a larger adjacent authority which would be under obligation to arrange such absorption on equitable terms approved by the Electricity Commissioners. This would encourage the development of supply areas which each had a fair proportion of undeveloped demand. It is only by the formation of such extensive and financially stable supply areas that the policy of general availability in the public interest can fairly be enforced.

The important question of the capital cost of distribution to farms may require special treatment. After the war, when a diminished income from investments abroad will force us to reduce our traditional import surplus, it may be necessary to subsidise the development of agriculture in an attempt to maintain our standard of living. What better form could such subsidy take than the provision of some part of the capital expenditure necessary to bring the advantages of electric power to our farmers and so permanently to increase their efficiency of production? Once the difficulty of the high capital cost of connection is overcome, the existing rates for supply are already sufficiently favourable to permit of the extensive use of electricity in agriculture.

## PRICE.

In considering this we are faced immediately by several of the most disputed problems, the settlement of which has proved very difficult to effect. These are all associated with (a) the advantages the consumer is likely to gain from large areas of supply, and (b) the form of ownership of the supply undertakings in such areas.

For the consideration of these problems it is desirable to place on record certain fundamental distribution data. Much analysis has been undertaken on this subject, but it is difficult to make entirely satisfactory comparisons because of the complexity of the factors involved and the restricted nature of the statistical information available. I propose therefore to limit the figures given to a minimum and shall deal only with broad trends about which there can, I think, be no dispute.

Fig. 2 shows how the total cost per unit to consumers has varied in recent years. It is evident from this that the proportion attributable to distribution tended to increase until the recent rise in the price of fuel. It is also evident, first, that distribution accounts for the larger share of the total costs, and secondly, that it has shown only a slight tendency to decrease; hence the importance which attaches to any efforts to achieve economies in distribution costs.

*(a) Size of Area.*

Only to a limited extent can much economy be looked for from technical developments; it must be found mainly through "rationalisation". Guidance on this can be obtained by comparing the average relative efficiencies of supply authorities of various sizes as shown by the resulting prices which they are able to charge their consumers. The general effect of size is shown in Table 6.

It would seem a reasonable deduction from these figures that, with equally efficient operation, a supply authority selling less than 20 million units per annum for lighting, heating and cooking cannot achieve the same economy as larger undertakings. It is impossible to prove this for all individual cases, as local conditions and less efficient management occasionally result in exceptionally high costs of distribution in large undertakings; instances can also be quoted of quite small undertakings with sparsely populated areas which, under exceptionally careful management, achieve comparatively low average selling prices. There are, however, no grounds for assuming that electricity supply forms an exception to the universal economic trend and so, within limits, increased size is bound to effect economies in

management, staff, purchasing and stores. Experience of this is directly afforded by the results already achieved during the normal growth of existing undertakings, and can also be deduced from the fact that many supply companies have already found it worth while to carry through a considerable degree of consolidation.

The argument for grouping into larger areas, based on increased efficiency and the resulting lower cost of electricity to the consumer, is not the only one. There are less tangible advantages to both existing and future consumers. The larger undertaking is better able to organise sales and to provide facilities for con-

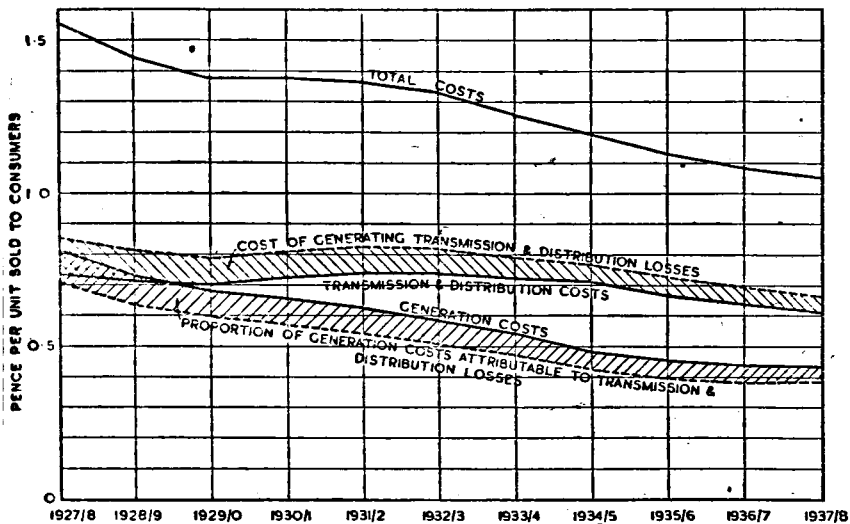


FIG. 2.

sumers' service. It is also in a better position to raise capital, to adopt long-period plans for increasing the availability of supply, and to carry its proper proportion of temporarily unremunerative consumers.

These general considerations lead to the conclusion that a broad policy of consolidation should be initiated by grouping, under some form of regional management, each supply authority having an output less than that indicated above. Although a few exceptions might have to be made where the area involved would be too unwieldy, such consolidation would result in a decrease in the number of supply authorities from nearly 600 to under 100. The smaller supply authorities which would be thus grouped with larger ones account for 30% of the total

units sold. The resulting expansion of activities would enable the desired economies to be effected without adverse effect on the technical staffs of the smaller concerns and would, in fact, give wider scope for the utilisation of proved ability.

One major difficulty in such grouping in the past has arisen because electricity supply areas have always been based on local government boundaries. This came about because the undertakings have been either municipally owned or made subject to eventual purchase by the local authority. This may have seemed the right policy in the early years but the expansion of electricity supply has long rendered it out of date. In fact, the boundaries of the local government areas have themselves become out of date for many purposes, and it seems probable that one of the most important replanning schemes which will have to be put in hand after the war will be the reorganisation and consolidation of local government. Hitherto it has been prevented by local jealousies and the unwillingness of Parliament to interfere in municipal affairs. The experiences of the war, particularly events in the London area, have, however, emphasised the urgent need for action.

*(b) Type of Ownership.*

All proposals for grouping inevitably raise the thorny question of the three possible types of ownership, i.e. municipal, company or some *ad hoc* public body. Rather than attempt to force a rigid universally applied solution would it not be best to recognise that each type of ownership has its advantages and disadvantages and that local conditions in one area may favour one type and in another dissimilar area another type? This particularly applies to the relative ease with which grouping can be arranged with the minimum disturbance to the existing organisations and the minimum interference with existing rights. It is not yet possible, in my view, to reach the conclusion that any one type is proved to be ideal, and therefore it would be advantageous to experiment with the different types under new conditions and to test, by statistical comparison over a period of years, the relative efficiencies of the three possible solutions in reducing costs and in giving progressive service to the public. This would put each on its mettle and would be a valuable national experiment from the point of view of planning other forms of industry.

Before approaching the question of the transfer of any actual supply undertaking, it would be necessary to ensure that its consumers would not be adversely affected. If its transfer were to be to a company it would also have to be made clear that this company would be under adequate public control and not

TABLE 6. RELATIVE EFFICIENCY OF VARYING SIZES OF SUPPLY AUTHORITIES, 1937-8

Grouping of undertakings in accordance with their individual sales of units for lighting, heating and cooking.	Number of undertakings in group.	Units in group sold for lighting, heating and cooking.	Average revenue per unit in group for lighting, heating and cooking.	Units in group sold for power.	Average revenue per unit in group for power.
millions		millions	d.	millions	d.
0-1 .	158	74.2	3.23	53.7*	1.08*
1-2 .	78	117.6	2.69	225.4	0.76
2-5 .	113	361.0	2.25	306.4	0.88
5-10 .	70	505.9	1.97	766.5	0.70
10-15 .	44	527.3	1.95	963.5	0.63
15-20 .	35	611.7	1.70	769.9	0.65
20-30 .	25	604.5	1.54	1,061.6	0.63
30-50 .	35	1,332.8	1.55	1,853.1	0.65
Over 50 .	30	3,213.4	1.56	4,211.1	0.62
Total .	588	7,348.4	1.69d.	10,211.2	0.65d.

\* Excludes 208.7 million units sold for electrochemical purposes by one hydroelectric undertaking which only gives a small public supply.

hampered in its development by uncertainty as to its period of tenure and other rights. It is therefore very desirable that any public consideration of grouping should be preceded by an authoritative announcement that it will be dependent on certain basic principles forming an integral part of the plan. The more important of these would seem to be:

(1) A clear statement that no rigid form of grouping is contemplated and that the only *sine qua non* is that economy will result and that the required unified management will be effectively established, with proper safeguards for the consumer and an incentive to a progressive policy.

(2) An undertaking that all company-owned concerns which are retained will:

- (a) be granted an extended tenure for a long period only terminable by a notice sufficiently long to avoid restriction of development;
- (b) be subject to purchase at the end of such period by some form of public authority formed to deal with electricity supply;
- (c) be purchasable on the basis of actual expenditure properly depreciated;



- (d) be subject to an approved sliding scale of dividend and to some control of new capital.
- (3) A guarantee to the consumers of the smaller undertakings that any grouping scheme will provide that no increases will take place in the tariffs, except such as may be approved by the Electricity Commissioners to cover increases in fuel or other basic costs.

With such safeguards it would not be unreasonable for the Commissioners to be given power to compel grouping. This would be so even where it involved the transfer of a small municipal undertaking to a company, since the economy which would result to the small undertaking by grouping would be greater than any possible difference which might be held to exist between the efficiency of public ownership and private ownership under public control. The whole policy should be one based primarily on the benefit of the consumer rather than on any doctrinaire ideas not directly concerned with this overriding object.

Although compulsory powers of grouping are essential to ensure the carrying-out of the general policy, such compulsion might be held in reserve for a strictly limited period during which voluntary grouping could be encouraged. Such voluntary grouping would have the great advantage of allowing local conditions and wishes to be given due consideration and due, but not undue, weight.

Many of us may think that a bolder scheme of wider regional grouping would be preferable; but in view of past experiences it may be preferable to begin with this more limited scheme and trust to experience of the advantages it will bring in order to justify a further extension at a later date. Such a policy would seem to conform more closely with our national preference for evolution, rather than revolution.

#### DOMESTIC TARIFFS.

Electricity is easily measured and a large part of its production is absorbed in capital charges; hence there has been much encouragement to experiment in various forms of tariffs. But sufficient experience has now been obtained to demonstrate that, for simplicity, convenience and promotional qualities, the most suitable form of domestic tariff is that generally known as the two-part tariff or the essentially similar step-block tariff. It is not, as yet, compulsory on every supply authority to offer a two-part tariff, although more than 80% do so. On the other hand, as a relic of early legislation, flat-rate tariffs for different classes of use are obligatory. This position should be reversed; indeed, I would go further and suggest that some form of two-

part tariff should be the sole available basis of charge. The difficulty of occasional consumption for lighting only can easily be met by making the fixed charge in the form of a comparatively high price per unit for a certain initial consumption. The actual rates for the fixed and unit charges must necessarily be left to the discretion of the individual supply authorities, subject to some overriding maxima. That for the unit charge should preferably be on a sliding basis correlated with the cost of fuel. Public opinion would, in view of the possibilities of appeal, quickly achieve some reasonable relation between charges in adjoining areas.

Standardisation of such a form of tariff for the country is not, however, enough. It must be supplemented regionally by standardisation of the basis of the fixed charge. At present many different bases exist, but the two which have become most widespread are rateable value and floor area. Each has its advantages and disadvantages and one may be more suitable in any given region than the other, but it is essential to settle for each region the one to be adopted. An alternative plan, which has its attractions, is for each supply authority in all regions to offer both bases as alternatives, leaving each consumer free to adopt the one which is most favourable to his individual needs.

Two new tariff problems are arising. One is the result of nationally co-ordinated generation, which brings out the importance of limiting the peak loads of undertakings at the time of national peak, whereas the present emphasis is on limiting the peak load whenever it may occur. The other results from the spectacular increase in domestic loads, which is tending to make the domestic load control the peak and is therefore increasing the importance of controlling the incidence of consumers' peak loads and of offering special tariffs for restricted-period supplies. Both these tariff problems are well worthy of consideration by the suggested Planning Council.

I am somewhat concerned that my remarks on electrical planning for Great Britain have proved so lengthy and I trust that the cause may be attributed to the number of things which need to be done and not to prolixity. Before leaving the subject, however, I should like to support the suggestion that when next any general electrical legislation is considered it should be combined with a consolidating Act which would replace the vast number of enactments that have accumulated over nearly sixty years. Lord Birkenhead achieved this for the far more complex system of land laws.

# DECENTRALISATION AND DISPERSAL

## MEMORANDUM ON PROCEDURE OF RESEARCH WORK IN GLOUCESTERSHIRE FOR PLANNING AND RECONSTRUCTION

*by*

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IN Gloucestershire, as in many other counties, war-time industries have been established in rural areas and these have, at least temporarily, upset local economics; this coupled with the bombing of one large centre of population in the county, convinced the Committee that the post-war problems arising in town and countryside would be of such tremendous proportions that to ignore the impact of these conditions on the county until after the war, would result in complete confusion and chaotic conditions, which to them as co-ordinating Planning Authority for the county could not be tolerated.

I have completed my Interim Report for the southern part of the county for a distance of approximately 10 miles to the north of Bristol. It has been found that the only method of grappling with the anticipated post-war development is to locate sites for new towns or the enlargement of existing nuclei which, being considered in relation to all the factors which affect the structure of town and countryside, will not only work in harmony with local economics but will ensure that the development of social and physical requirements are not retarded.

The location of new towns must be considered in relation to all existing physical, social and economic conditions.

A brief outline of the method of "sieving" to locate new town sites is as follows:

### I. SURVEY OF THE GROWTH OF DEVELOPMENT.

This section is illustrated by a map, the two main colours of which are orange and red; the orange indicates the development which existed ten years ago and the red the development which has taken place since that time. A glance at this map indicates the direction in which development has proceeded; an interesting point brought out by this survey is the effect of the public ownership of certain land, which, being in an unfortunate position in relation to the development of the town,

forces development to proceed in directions which are undesirable. The wedge of land referred to is one running well into the built-up core of Bristol from the country outside, and the effect of this has been to force the spread of development on each side of the wedge out into country areas.

The two lessons learnt from this study are (1) that to be an effective weapon in the control of the spread of towns, municipal ownership of land is valuable provided the land owned is circumferential as well as radial, and (2) the enormous attraction to developers of being attached to a huge agglomeration as indicated by the fact that, in the southern section of the county, 82.1% of development of the last ten years has proceeded contiguous to Bristol and only 17.9% in the villages and small towns within easy reach of Bristol. The objective of post-war activities must be to reverse these percentages during the years to come.

## 2. HISTORY.

A great deal can be learnt from the history of the area ; whilst this section may appear relatively unimportant it can help to a marked degree in overcoming present-day difficulties. The eighteenth century saw one of the greatest changes in the agricultural development, particularly on the Cotswold Hills. Here the land had been open and unfenced from the earliest times, and devoted almost entirely to the great flocks of sheep which brought prosperity to the towns and villages ; but as during the period of the wars with France agriculture increased, large areas of hilly land were broken up into ploughland and enclosed, so that the thirty years preceeding 1780 saw complete districts previously open converted to a state of enclosure.

After the peace following Waterloo, however, the pinch of depression again came to be felt, and the effects of the Industrial Revolution were clearly evident. Goods, including woollen goods once produced in rural homes and villages, tended increasingly to be made in factories situated in or near the coalfields and the population began to move away to the towns ; with the age of steam the countryside became stunted in growth.

The problem to be confronted in post-war years is that of counteracting the effect of the Industrial Revolution.

Further, we see the diminishing prosperity of Bristol in the early nineteenth century, for these reasons : (1) the rise of Liverpool, which had better natural facilities as a port, (2) the general migration of manufacturers to the northern coalfields ; this process had been offset to a considerable extent by the introduction in the eighteenth century of manufactures of iron, brass, tin and copper, and the flourishing West African trade, sugar being taken in exchange for slaves, and (3) the abolition

of the slave trade and the consequent loss of the slave trade, which, combined with the loss of the American colonies, reduced Bristol trade by half. The city did not recover until the middle of the nineteenth century. Since that time, Bristol has regained its prosperity and has become the biggest British port owned and operated by a municipality.

### 3. PHYSICAL CONDITIONS.

The next investigation is in relation to physical conditions and contours of the land. This of course has an important bearing on the location of sites for development, since it is obvious that if buildings are to be erected economically, steeply sloping land must be avoided and reasonable gradients on the road and excessive fall of the land must be avoided, for drainage purposes, but at the same time sites should not be so flat as to be devoid of interest and consequently depressing to people who will live in the town. It is desirable to eliminate land which has a gradient of 1 in 8 or steeper. Due regard should also be paid to the exclusion of high land which from engineering, accessibility and climatic conditions is unsuitable for development.

### 4. GEOLOGICAL CONDITIONS.

The next investigation concerns geological conditions; I believe that the influence of these conditions on the location of population and industry is not fully appreciated. Some minerals have a high market value; e.g. in Gloucestershire there are extensive coal measures, limestone beds, deposits of sand and gravel which are actively worked, and workers wish to reside within a reasonable distance of their source of employment.

There are two coalfields in the county; firstly, the northern end of the Somerset and Bristol coalfield which runs out in a northerly direction from the eastern part of Bristol for a distance of approximately 8 miles, and secondly, the coalfield of the Forest of Dean.

To obtain a more accurate picture of the effect of these deposits it is necessary to investigate the potential life of each measure, as this will directly influence consideration as to the need for a new town or further development of existing centres. This perhaps may be better illustrated by reference to the Bristol coalfield which is found in two divisions separated by a huge thickness of pennant rock. By careful estimating it was found that the upper measures have a limited life, at the present rate of production. Many attempts have been made to work the lower measures but all have proved fruitless, mainly because of the fact that it is heavily watered; however, in consultation with expert geologists, a location has been found where the measures

can be worked economically and this, of course, has a direct influence on the location of a new town.

The Forest of Dean coalfield is a very ancient one and it has been found that there is even less potential life than the Bristol coalfield. Penury faces the inhabitants unless the area can be classified as a "receiving area" by a Central Planning Authority when considering the distribution of industry.

The limestone bed is found in the south of the county and on the fringes of the Forest of Dean coalfield; in each case the limestone is so near the surface of the earth that it would be uneconomical to plan a town upon it, as this would mean the cutting of channels in rock, for the laying of sewers and other mains. Apart from this consideration, the market value of this limestone is good, since it can withstand a high compressive stress of 32,000 lbs. a square inch and is in great demand for roads, bridges and substantial buildings in many parts of the country.

The red marl is also found extensively in the south of the county and is the source of employment for many hundreds of men in the manufacture of bricks. Investigation has been carried out as to the economical limits of working this deposit and this directly influences the considerations, firstly, in regard to the value of the mineral and secondly, in regard to the location of workers and their families.

##### 5. RAINFALL.

Investigation should be carried out concerning the average annual and intensity of rainfall; much useful information has been obtained on this subject from the Air Ministry Meteorological Department. The question of the intensity of the rainfall has an important bearing on the location of towns, since if all other considerations are equal, areas having a high intensity of rainfall should be avoided, otherwise excessive sizes of surface water sewers would result. The Air Ministry Meteorological Department can supply detailed information for small areas and their co-operation in this matter is very valuable.

##### 6. LANDSCAPE AND WOODLANDS.

It will readily be appreciated that there are three main types of landscape: (1) the uninteresting landscape, (2) the normal English landscape, (3) the picturesque, such as is found in the country in the vicinity of Bath, in the Cotswolds and Forest of Dean.

Obviously it would be as undesirable to destroy the picturesque landscape by the insertion of a development scheme as it would be to locate the town in an area aesthetically uninteresting; it

therefore is desirable to avoid both these types of landscape and locate the town in the normal landscape area, leaving the picturesque for enjoyment by the public at large.

There are few enough woodlands in this country without destroying those which exist unnecessarily; these not only form an integral part of the landscape, but where they are open to the public they form a valuable source of mental uplift. It is, however, necessary to realise that normally woodlands are as much a crop as wheat or potatoes. Discretion should be used as to which woodlands are interfered with by development, since some obviously must be quite unimportant and no harm would be done to the countryside as a whole if they were cleared; on the other hand, the removal of a small clump might completely destroy the amenities over a wide area.

#### 7. WATERSHEDS.

The next examination undertaken is into the main and subsidiary watersheds and basins. By careful investigation the water-parting line is found and all water-courses are traced to their sources. The application of this study in relation to the location of towns is that to be drained economically a town should be situated in the watershed and not sitting astride one or more parting lines. Obviously, the most economic method of sewerage a town is by gravitation, and if a town is located in two or more watersheds, two or more independent sewage disposal works will be required, or alternatively, it will be necessary to resort to the pumping of sewage to one disposal works. This is standing charge which might well be avoided.

#### 8. LAND DRAINAGE.

The next consideration is that of land drainage and the ease with which water falling upon the paved surfaces of the potential towns may be disposed of. This study is closely related to that of watersheds and it is important to determine the capacity of the main river which will be conveying the surface water from the town to the sea. It is also necessary to consider how surface water may be disposed of, particularly if an existing settlement is situated near the confluence of the river taking the surface water, with another river. It is a reflection on the intelligence of the people of this country that in winter time thousands of acres of land are flooded and in summer time water is being carted to towns and villages affected by drought. If steps were taken to impound water fairly near the head of the tributaries of the river, excessive flood would be unknown, and by adequate control, water could be allowed to run through ditches and streams in summer time, thus ensuring amongst other things a con-

tinuity of water supply to farms. Investigation might also be carried out as to the piping of the impounded water to towns for non-domestic purposes. It appears to be uneconomical that much expenditure is involved in pumping water from the bowels of the earth and possibly purifying it, to be wasted by street washing, washing of cars, watering gardens, etc. It is, therefore necessary to investigate where such impounding could be satisfactorily located, and such sites obviously must be avoided in siting a town; if the question of piping the water is given consideration, due regard must be paid to sufficiency of head of water to supply the higher parts of the town.

#### 9. HEALTH AND LEVELS OF SUB-SOIL WATER.

The health of a locality is often influenced by the nature of the soil and dwelling-houses on an unhealthy site can never be made healthy. Underneath the surface of the earth there is a sheet of water known as "ground water", the level of which varies with the influence of the geological conditions, with the intensity of rainfall and in some parts with the ebb and flow of tides. Between the level of the ground water and the surface of the earth, the interstices of the ground fill with air, consequently as ground water rises, impure air is expelled, and if a house is located on such ground, this damp and impure air finds its way into the dwelling-house. Medical opinion is that in a really healthy site ground water should not rise to within less than 10 feet of the surface of the ground, in order to give the impure ground air an opportunity of being dispelled without penetration into a house; therefore this consideration is very important in the location of towns, as good health is the foundation of a happy community. The area is surveyed to ascertain the levels of ground water throughout the year; where the water rises to within 10 feet or less than the surface, such land should be excluded from development.

#### 10. ACCESSIBILITY.

The ease of access to 'bus routes and railway stations are bound to have a considerable influence on the conclusions as to the correct location of towns. Existing railway stations are static, but 'bus routes can be altered with comparative ease. The greater the national importance of a certain railway route, the more any station on this route must influence the value of land in the vicinity and the rapidity of development. By collaboration with the railway company it should be possible to arrange for an improved railway service if this is necessary.

During the course of this investigation all the 'bus routes and the frequency of services are ascertained and illustrated on



a map together with the area of land covered by  $\frac{1}{2}$  mile's walking distance from the 'bus route; on the same map, the radii of influence of railway stations and traffic capacity are indicated and a glance at the map will indicate which areas are most accessible from the national, regional and local points of view.

#### 11. CANALS.

There are several canals in this county, but most of them have fallen into disuse because of the opposition of other interests; but the reconditioning of canals which will assist the national problem of distribution and at the same time promote the correct dispersal population and industry, should be considered.

The reconstruction of such canals would form valuable schemes for the absorbing of the unemployed after the war. This question must of course be considered on a national basis, but, nevertheless, it does influence, at least to some extent, the consideration of the location of towns.

#### 12. DOCKS.

In Gloucestershire there are many docks, but the four principal ones are those of Avonmouth, Gloucester, Sharpness and Lydney. The latter two docks have ample scope for development. The value of West Country coast ports has been duly appreciated in the last two years or so, and as a matter of national security it appears that the smaller docks capable of economic expansion should be improved. This question opens up many avenues of investigation and in particular in relation to the location of development areas to serve the docks.

#### 13. AERODROMES.

The next subject is the investigation of the distribution of aerodromes and landing grounds. These are mainly governed by technical considerations, but they must also be considered in relation to the centre of population which they are designed to serve.

The future of civil aviation is a matter for speculation, but the present view of several firms engaged in aircraft manufacture is that there is little future in civil aviation. This view is based on two primary arguments, firstly in order to use a De Havilland Moth, for example, for private flying amounting to 400 flying hours a year the cost is £1,016 exclusive of landing ground fees, maintenance, etc. At the present rate of taxation a gross income of £30,000 is necessary to produce a net income of £5,000 which is the lowest amount necessary to operate a small 'plane. Secondly, the high risk attached to flying maintains high insurance rates which, when compared with the insurance rates for cartage

by road, are prohibitive. The reason why the motor-car has become so popular as a means of travel, as opposed to railway, is that it provides door-to-door transport; aeroplane travel cannot provide such facilities. Until man can control the weather air travel is not likely to develop as a major means of transport.

Under the circumstances consideration has not been given to the reservation of aerodromes for each possible town. However, certain municipal aerodromes were established prior to the war for large towns and in siting new towns regard is paid to accessibility to these.

#### 14. HIGHWAYS.

Continuing the study of communications, attention is next devoted to highways and the relative importance of each highway in the national, regional and local framework.

It is possible to determine where deviations from existing routes are necessary and the routes of such proposed improvements should be avoided. No regard is had at the present stage to entirely new roads, since they must be designed to serve the town sites which are selected.

From a study of the traffic statistics it will be seen that the high importance given to "through traffic" is in fact unwarrantable; highways carry mostly "shuttle" traffic between nearby centres of development.

#### 15. RAILWAYS.

The next step in investigation is that of the railway routes, the volume of traffic and the increase and decrease in volume over the last ten years. These statistics will give an indication as to the tendency of traffic on the railway lines. Contact is also established with the railway companies concerned in order to ascertain projected railway routes; such routes must, of course, be kept free from development, yet at the same time due regard should be had to these in relation to the location of the towns for communication purposes.

#### 16. PUBLIC SERVICES.

##### (a) *Electricity.*

The most important public service in connection with the distribution of industry and population is that of electricity. The survey of the county includes the routes of 132 kv., 33 kv., and the 6.6 kv. lines and, in addition, the areas of the county which at present have a low tension supply suitable for domestic use.

No doubt the electrification of rural areas is a step in the

right direction. There has been considerable growth in this service during the last ten years, but the survey in the south of the county indicates that in spite of all the many electricity lines which deface the countryside, only a very small percentage of country areas actually has a low-tension supply.

The invariable rule is that the cost of supply in rural areas is higher than in urban areas. Clearly there are grounds for the development of electricity in rural areas coupled with an adjustment of charges so that rural areas may have adequate electricity supply, if not at cheaper rates than urban areas, then at least at the same. Dwellers in urban areas should appreciate their dependence upon rural workers and help to provide them with the amenities now principally enjoyed by the former.

In considering the location of towns preference should be given to areas which have an existing low-tension supply, provided all other considerations are equal.

*(b) Water Supply.*

There are several large statutory undertakers supplying water in the county, but the majority of the area is dependent on wells. The survey includes information as to the quantity of water which can be delivered at specific points by the statutory undertakers according to the size and pressure of existing mains and, in addition, which springs now running to waste might be harnessed to serve new towns.

The question of an adequate supply of pure water is an important consideration which is not only necessary for the new towns, but also to encourage high farming.

*(c) Sewerage.*

An important consideration in endeavouring to locate the most satisfactory site for towns is the economic use (or provision) of sewerage systems. All other things being equal, it would be unwise not to utilise an existing system either in itself or by forms of extensions.

The survey includes the location of sewage disposal plants and their capacities, the stream into which the effluent is discharged and the population existing sewers can serve before they would be required to be relaid and the condition of the sewers. Whilst it is relatively easy to extend a sewage disposal plant it is more difficult and expensive to relay or duplicate the existing sewerage system.

*(d) Gas Supply.*

Due regard should also be paid to the availability of gas, and the survey has included the statutory supply areas, the routes of mains and pressures.

The reason for the survey of this service is similar to others, viz., that provided all other considerations are equal, private or public money invested in these services should be fully employed before new services are provided.

#### 17. AIR RAID PRECAUTIONS.

Regard is being paid to the percentage of bombs dropped within radii of targets and as to the effect of blast from the different types of explosives; this being investigated in regard to the proximity of industrial to residential areas. Whilst it is earnestly hoped that this is the last war that mankind will have to endure, it would be unwise to ignore the possibility of others occurring.

#### 18. EDUCATION AND SCHOOL ACCOMMODATION.

In the search of the location for towns, the economics of existing school accommodation should be investigated. Obviously it would be wasteful to ignore the recent expenditure on schools whether elementary or secondary; or the possibility of using existing accommodation in older schools, if this should be available; or the up-to-date policy of the Education Committee. The whole of the school accommodation of the county has been ascertained and information has been obtained as to the normal accommodation, the number on the register at each school on the 30th June 1939, the state of the school, whether overcrowded or whether there are any vacancies, and if so the number of vacancies. Regard has been paid to recent decisions of the County Education Committee for the location of new senior schools to be established under the Hadow Report.

School accommodation will, of course, have to be provided in the new towns, but it is necessary to give consideration to the education of the children while the towns are in process of evolution; in the interests of economy, existing school accommodation should not be wasted. This question is also considered in relation to the walking distance for the youngest child, based on a 20 minutes walk, at a pace of 3 miles per hour. With the usual school lunch hours break of  $1\frac{3}{4}$  to 2 hours, it should be possible for the youngest child to go home to lunch and have at least 65 minutes in which to eat and rest before returning to school.

#### 19. HOUSING.

The housing survey is a most important one. Local Authorities were very active prior to the war in clearing slums. In the establishment of our new towns, it is necessary to consider the

possibility of re-housing people, not in soulless masses of people and houses, but in the new towns socially complete where they may enjoy town amenities. The survey, therefore, includes information as to the houses which are in such a poor condition that they should be classified as slums during the next five years ; it is followed by a survey of those houses which are likely to come within a similar category during the next fifty years. From this information it is possible to ascertain the number of people who will be compelled to remove during those periods, and this information will not only prove useful for the comprehensive replanning of built-up areas and the gradual realisation of the plan, but it will also give an indication of the demand for new accommodation, in two stages, for part of the development of new towns.

#### 20. PUBLIC HEALTH.

After housing statistics those of public health are investigated in various parts of the county, and the reasons for high death rates in excess of the national average are ascertained ; such high rates as may be found, may be due to circumstances which are governed by natural conditions. Such areas must be avoided in the location of our towns and consideration given to the gradual extraction of the population from such areas to the new towns.

#### 21. POPULATION.

The question of the existing distribution of the population is next considered in regard to (a) its present position, (b) estimates of the future population ; both taking into account (a) numbers, (b) age composition, (c) sex composition, (d) number of households, (e) professions, (f) local and regional distribution, (g) and movement.

#### 22. INDUSTRY.

In order to obtain a comprehensive picture of industry in the county the questionnaire set out in Appendix A has been circulated to all industrial hereditaments in the county and much useful information has been obtained. In this, as in other counties, industrial buildings have been established, which, whilst engaged on war production at the present time and are satisfactorily located, can be adapted in peace-time for the manufacture of private necessities ; each building has been inspected with a view to ascertaining the peace-time manufacture for which it would be suitable.

It is also possible to determine the number of workers each factory can accommodate. Information has been obtained from

a large number of manufacturing concerns as to the floor and land space (in square feet) per worker required for efficiency and economy in operation.

With the difficulty of obtaining materials for the building of houses, workers have to travel long distances between home and work and so long as the war lasts they will continue to do so without excessive grumbling; but immediately the war ends there will be an urgent demand to get back to normalities as soon as possible. It follows that there will be a demand for dwelling-houses of different types within a limited distance of such factories; the question arises as to whether each industry is to be allowed to encourage its own development complete in everything except the essentials of sound communal development, or whether sites shall be located within reasonable reach of several factories where the people can live as a community in the necessary social intercourse and where, owing to the size, the social amenities of town life can be provided.

In the attached Appendix I wish to draw particular attention to questions 8, 11 and 20; the answers supplied to these questions have been most helpful and will assist materially in forming an idea as to the composition of the towns. After the town site has been located it is necessary to consider linkage of different industries; the cyclic fluctuations in output; the age at which employees in various processes are considered to be too old, in order to ensure the appropriate grouping of factories.

### 23. AGRICULTURE.

The final investigation is in relation to agriculture, and for this purpose Dr. Dudley Stamp's suggested national classification was applied locally.

The classification is as follows:

*Category One.—First Class Land.* This land is level or gently undulating; it is deep, fertile, easily worked loams or silts. Its general use in 1939 was predominantly arable—often intensively cultivated.

*Category Two.—Good General Purpose Farm Land.* This land is well drained; the soils are of good depth, generally tending to a loamy nature and workable for much of the year. It is divided into two sub-categories, (A) predominantly arable and (AG) predominantly pasture farming; the sub-categories correspond to the uses in 1939.

*Category Three.—First Class Land.*—This land is similar to that in Category One, but is that with high water table or liable to flooding or for other reasons is regarded as more suitable

for pasture rather than arable. Its predominant use in 1939 was fattening and best dairy pasture.

*Category Four.—Good Farmland*, but with heavy soils needing drainage. The land is fertile but apt to be cold and late, and unworkable if too wet or too dry. In 1939 its predominant use was "neutral" grassland.

*Category Five.—Downland* and allied areas with thin light soils generally on limestone. It has two sub-categories (A) where ploughable it is barley-turnip-arable-sheep land and (AG) where unploughable, downland or basic fescue; the sub-categories correspond to the uses in 1939.

*Category Six.—Medium Quality Farmland*. It is productive, but is that which by reason of slope, climate or soil is not of high quality; it is often very mixed. Its uses in 1939 were crops and grass especially under long leys.

*Category Seven.—Poor Quality Heavy Land*. Either it has very heavy intractable soils or is low lying and difficult to drain. The general use in 1939 was acid grassland with rushes, etc., grading to *Molinia* and wet moor.

*Category Eight.—Poor Quality Mountain Land*. It has thin poor stony immature soils, usually leached or podsollic; often with rock outcrops or with patches of acid peat. In 1939 its general use was mountain moorland or rough pasture.

*Category Nine.—Poor Quality Light Land*. It has very light sandy podsolised soils usually too hungry for economic cultivation. In 1939 it was found on lowland heath and moors.

*Category Ten.—Poorest Land*. This land is shingle, sand, warth land; its use is unchanged since 1939.

In the location of the towns in Gloucestershire, the County Planning Committee have accepted the suggestions made by Dr. Stamp; these are (a) that the first four categories of land, i.e. the best agricultural land, both arable and pasture, should be retained primarily for agriculture, (b) that the land scheduled for development under Planning Schemes either for the enlargement of existing towns and villages or the establishment of satellite towns, garden cities, etc., should be land of intermediate quality, and (c) that the four poorest qualities of land should be used for major schemes using large areas of land, such as for regional open spaces and the encouragement of afforestation. Therefore, in selecting the sites for towns particular attention is given to the location of the intermediate quality land. It will be appreciated that these

broad divisions will ensure (a) that best agricultural land is retained for food-growing purposes, (b) the intermediate quality land which is capable of growing food to a limited extent is used for development to a reasonable degree, and (c) the poorest land which is of little use for agriculture should be used mainly for intensive afforestation. Adopting this method, the whole of the land in the county will be used to its best advantage.

#### CONCLUSIONS.

Having made the survey, by a process of elimination, certain localities are automatically excluded from consideration, and certain areas stand out as pre-eminently suitable for development ; but in order to place all these things in the right perspective it is necessary to give prominence to the requirements of nature. Health and food cannot be given man, if nature decrees otherwise, but sewers, highways, water, schools, etc., can ; it follows that in the final summing up as to the location of towns, preference must be given to conditions ensuring health and the protection of food-producing land, and it is upon this basis that the town sites for Gloucestershire have been and will be obtained.

All will agree with W. A. Robson in *The Government and Misgovernment of London* that the new town idea offers to hundreds of thousands of people who are now penned up in the most squalid and sordid quarters of our urban agglomerations, the possibility of a healthy and spacious existence amid pleasant surroundings, with easy access to the countryside, and that " it provides a method of spending very large sums of public money on projects which are likely to offer reasonable prospects of becoming ultimately self-supporting—a consideration of some importance when the need for large-scale public expenditure to relieve unemployment again arises ". This book was written before this war, but at the present time the prospect of unemployment looms in the foreground in the immediate post-war months.

The Gloucester County Council have appointed a post-war Public Works Programme Committee ; it is the intention of the Council that such schemes that they are capable of promoting for the relief of unemployment should be part and parcel of the plan for the optimum Gloucestershire.

#### APPENDIX

1. Name and Address of Firm (Code Number).
2. Nature of Industry.
3. Location of Industry.
4. Total number of employees at present time. (a) Men ;  
(b) Women.



5. Total number of employees in time of peace (before war).  
(a) Men ; (b) Women.

6. Anticipated number of employees (other than casuals) after the war ?

7. Does the housing situation affect your supply of labour at the present time ? If so, in what way ?

8. If you have become established in Gloucestershire as a result of the dispersal of industry resultant upon the war, do you intend to settle permanently ? If so, how many houses and what type of housing will you require ?

9. What proportion of your employees travel to work by train (or other means of conveyance) from other districts ?

10. (a) What is the nature of your principal raw material ? (b) Does it come by rail, canal or road ?

11. Do you consider there is any need for the establishment in the district of any industries for the manufacture of goods which are either used in your industry or are made from the by-products of your industry, either now or after the war ?

12. Within what radius do you rely on Motor transport for : (a) the despatch of goods from the factory ; (b) the delivery of goods to the factory ?

13. Can you give approximately yearly goods traffic in tons :  
(a) Inward : (i) by rail ; (ii) by road ; (iii) by water ; (iv) by air.  
(b) Outwards : (i) by rail ; (ii) by road ; (iii) by water ; (iv) by air.

14. What form of power do you use ?

15. Do you produce your own power ? If so, is it generated by steam or gas ?

16. Would you be interested in an increased public supply of electric power if available ?

17. Has your industry (a) grown up in its present position ; or (b) has it migrated from another district ?

18. What in your opinion are the special advantages of this district as a manufacturing district ?

19. What are the disadvantages ?

20. In view of the Government's expressed intention of formulating a policy for the reconstruction of town and countryside now, for immediate operation after the war, have you any views as to how your industry or its location could be improved ?

# MEMORANDUM ON THE DEVELOPMENT OF A NEW TOWN

by

H. A. MEALAND, F.R.I.B.A., M.T.P.I.

TOWN PLANNING OFFICER, BATH

## GENERAL PRINCIPLES OF LAY-OUT.

THE general survey having been made and the new town site selected, an ideal town plan should be prepared on broad lines without paying too much attention to the question of cost. If a long-term policy is foreshadowed and the prepared plan is well thought out, the ultimate cost should not be prohibitive.

This plan should include the following points :

1. Main lines of communication—(a) roads, (b) railways, (c) canals and rivers (if any).
2. Use Zones—(a) industrial, (b) general business and commercial, (c) residential (correct balance being maintained). Specified sites for communal buildings, i.e. churches, schools, places of recreation, etc., etc., should be located.
3. Parks, pleasure grounds and recreational centres should be allowed for on a basis of 7 acres per 1,000 head of population.
4. Limitation of economic size should be arrived at and an agricultural belt planned, encircling the town. The actual size depends on locality and type of town but should not on a general principle exceed, say, 50,000 persons.
5. If possible sufficient land should be acquired to make the town self-supporting as regards fresh vegetables and dairy produce.
6. In a country as small as England great care should be taken to preserve existing features of architectural and historical interest.
7. Although the broad lines of the new town should be definitely laid down, it is suggested that the plan should remain elastic and the details be filled in, as occasion arises.

## SOCIAL AND ECONOMIC STRUCTURE.

The war will undoubtedly bring many changes in our social and economic structure and it is difficult to foresee exactly the position on the cessation of hostilities.

It is certain that there will be less money to spend and smaller

homes will be required. Our war occupations (the Army, Civil Defence and Munitions) will tend to a levelling of social status and we should mix more freely, hence the new town might conceivably have less class distinction and not have the working and leisure classes so distinct as hitherto. Although the majority of people will still ask for homes and gardens there is a place for flats for old people, for those who prefer town life and for the many unmarried women that always follow a war when large numbers of men lose their lives.

To assist in the problem of unemployment many more public works and the extension of electricity plus other labour-saving devices will be put in hand, thus reducing the work of the housewife. The British Restaurants now in being may increase our liking for communal centres and to some extent cut out individual catering. Other devices now unheard of, for example, communal heating, hot water supply and new methods of transport, must not be lost sight of. Although I do not think commercial aviation within the borders of Great Britain will ever be popular because of excessive costs, it is possible that new and cheaper types of aeroplanes, that can land in small areas, may be invented and brought into general use. War inevitably puts inventions years ahead of normal progress. Aerodromes should, therefore, not be forgotten, although I am not of the opinion that they are required in every new town.

Working hours, in all probability, will be cut down owing to vast improvements in machinery and methods of manufacture and planning for leisure will become an important factor. Arising from this comes the question of better facilities for the education of the masses. Universities, technical and high schools should be available for all who require them.

In fact our whole social and political structure may be completely revised and this will affect the planning of the new town.

#### LEGAL ASPECT.

Existing legislation, Section 35 of the Town and Country Planning Act, 1932, enables garden cities to be founded either by a local authority or by an "authorised association". The Minister may acquire the land and vest it in a local authority or "authorised association". The local authority also have power to acquire the land, either by compulsion or agreement.

This section of the Act has not been employed to any great extent, but it would appear that more use could be made of it. However, we may expect more comprehensive legislation before long.

**FINANCIAL ASPECT.**

The creation of a new town cannot be undertaken by private enterprise or local authorities unless large sums of money are available to meet the financial obligations until such time as the town becomes self-supporting.

It is, therefore, essential that Government aid be made available. The whole of the land required must be purchased at the outset and must include the agricultural belt. This is most important and will ensure that the town will not extend beyond the specified limits, and give complete planning control. The cost of roads and public services should be borne by the Government and these laid down before development is allowed to commence.

In connection with the acquisition of land it is essential for values to be stabilised, otherwise prohibitive prices will have to be paid. New legislation is, however, being compiled whereby land may be acquired at its 1939 value and this should make the acquisition of land for redevelopment an economical proposition. In the majority of cases this would be agricultural value.

It must be realised that many years will elapse before any return is received for the huge initial outlay and the need for a long-term policy, both in the development of the town and in the financial aspect, is essential. It is, however, certain that in time the town will develop into a paying proposition.

It cannot be too strongly emphasised that Government assistance is necessary in order that redevelopment can be carried out both in rebuilding the "blitzed" areas of our large cities and the establishment of new towns. Decentralisation of population and industry must take place in order to make this country a better place to live in. We cannot under any circumstances revert to the conditions prevailing before the war. The Government is spending £14,000,000 a day on the war. Surely it is not too much to ask them to expend a few more millions on the peace which follows. The one great difference between war expenditure and the proposed "peace" expenditure is that the latter will be in the nature of a long-term investment. The Government will see a definite return in the establishment of healthy towns, in the creation of healthy and happy communities and, perhaps most important from their point of view, financially.

**ADMINISTRATION.**

The administration of the new towns forms one of the major problems which must receive careful consideration. This may to a large extent depend upon the character of the new town. If it is a satellite to a large city then it might be practicable to conduct the administration from the parent city. Although the

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new town will be situated in the area of a Rural District Council it would be inadvisable to allow such a Council to undertake the administrative work, the main reason being that the character of the particular area will change from rural to urban.

Until such time as a town is complete, or nearly so, administration might be undertaken by an estate committee consisting of government planning experts (including the Regional Planning Officer) and members of the County and/or County Borough Councils. The Committee should have power to appoint officers such as Engineers, Surveyor, Architect, Treasurer, Clerk and other officials and should be conducted in a manner similar to existing local authorities. This seems to be the ideal way of administration as all the officers will be on the spot to look after the interests of the Estate Committee.

The use zones should be strictly enforced and every effort made to make the town attractive. Strict control should be exercised over the architectural appearance of the buildings whether industrial, residential, business or civic and the question of advertisements should be strictly controlled.

At a later date, should circumstances permit, the new town might become an urban district and the Committee function as an Urban District Council. It would then cease to be under direct Government jurisdiction and would take its place as a self-governed community.

# THE RECONSTRUCTION OF TOWNS

*by*

D. E. E. GIBSON, M.A., A.R.I.B.A., A.M.T.P.I.

BEFORE considering the redevelopment of towns, it would be as well to study their growth and the reasons for their present state of unsuitability to a modern civilisation.

Coventry may be taken as a typical example for this purpose. Coventry developed slowly from an early English rural settlement to an urban centre of 12,000 people towards the end of the fifteenth century, this growth being largely due to the establishment of a richly endowed Benedictine monastery in the eleventh century. In the mediæval period it was a self-contained city with a number of trades controlled by craft guilds, which later gave way to merchant guilds as inter-city trading developed. Lack of communications prevented the excessive growth of mediæval towns and the city remained fairly static until the end of the eighteenth century, when the improvement of roads and the new canal system gave impetus to the weaving and watch-making industries. These industries were of the home-workshop type and many of these curious three-storey houses (the workshop forming the second floor) form the central slum areas to-day. With the mechanisation of manufacture at the time of the Industrial Revolution, the large gardens and open spaces, much in evidence in the mediæval city, were gradually built over by the larger workshops, and, as communications were still poor, housing for the workers.

Towards the end of the nineteenth century, the city became very closely built with a chaotic mixture of factories, business premises and houses. This lack of space compelled new factories to go outside into what is now the "middle ring" of the city, this dispersal being helped by improved transport facilities such as the bicycle, railways, and later the motor-car and electric tramcars. From this stage on, with the development of cheap road transport, the city grew rapidly; the "middle ring" of "bye-law" streets of "tunnel back" houses was rapidly surrounded by an "outer ring" of garden suburbs and "ribbon" development. Coventry had by now (1939) reached a population of 230,000 and the mediæval city had become the business and commercial centre with a fringe of "blighted" housing and industrial slums due to speculation in potentially higher land values as commercial sites. The high land values caused more intense development in the

centre by increased height of buildings, and this, together with the rapid growth of road transport, brought an incredible state of congestion to the narrow, winding streets, many still of the same width as in mediæval times.

The rapid development in the twentieth century was based on the radial road system existing in the fourteenth and fifteenth centuries and few convenient ring communications were established until the last decade, when efforts were made to by-pass the more congested points. The effect of the probable increase in road transport on the already overloaded street system with accompanying traffic jams, dust and noise is impossible to contemplate, but how to finance the necessary reconstruction in face of the inflated central land values and lack of compulsory powers in local government?

This then is the city of to-day—overgrown, unplanned and unhealthy—what is to be done? Our cities should be planned and built for living and working in the best possible way; they should be planned to provide a proper environment for those necessities of a full life, a healthy body, a cultured mind and a radiant soul. The city must provide for this purpose, an amplitude of sunlight, air and green spaces—large parks, gardens and recreation grounds—means of free movement, wide roads, convenient roads—museums, art galleries, libraries, colleges—hospitals and clinics—music, drama, and, above all, good housing, —housing in the form of separate dwellings, terraces and flats according to the need. All these necessary parts to the city must be inter-related in the most efficient manner. It is obviously impossible to achieve this symmetry in practice, particularly in the reconstruction of existing cities, the lay-out being governed by such things as natural features, the configuration of the ground and the development of the surrounding region.

The first steps to be taken to achieve the planned reconstruction of the city are (a) factual surveys of existing conditions both physical and sociological and (b) the preparation of a master plan. The master plan should indicate in outline, the ultimate requirements of the city for such features as:

(1) *Main Roads*.—The road pattern of the city should generally take the form of a spider's web, with radial and ring routes, the main arteries being developed as parkways with the radial roads taking the line of green wedges coming into the city at least as far as the central ring road, with widely spaced connections by secondary roads.

(2) *Open Spaces*.—These should provide recreation for the population of types needed for all age groups, formal and informal parks and gardens, sports grounds and children's playgrounds, and be within easy walking distance of the residential areas. It is

desirable to link up the various open spaces with green strips in a continuous park system, the whole system being linked with the open country by wedges of green projecting to the city centre.

(3) *Residential Areas.*—The housing of the people is of great importance and the plan should indicate the areas for residential purposes, preferably designed for grouped development in units of approximately 20,000 people. Each unit should have its community centre, comprising shops, schools, branch library, health clinic, cinema, recreation halls, etc., and should be spaced within the containing main roads. Housing in the “middle ring” should contain a proportion of flats and terrace-type housing, while the “outer ring” would provide for those needing a house with garden.

(4) *Industrial Areas.*—Land should be zoned for factories, where industry can be carried on in the most efficient way, reasonably level sites with good communications by road, rail and canal, and all necessary services. Industry should be sited within easy reach of the workers and for this purpose a number of factory zones must be provided in a large city, with modern methods of production and electrically driven machinery; this can be done with a minimum loss of amenity to adjoining residential areas.

(5) *The Central Area.*—The central area of the city should be reserved for those essential community services which cannot be economically dispersed to the suburbs, such as the Civic Centre, containing town hall, municipal offices, law courts, and central government buildings. The Cultural Centre containing museum, art gallery, art school, technical school and adult and youth education centres. The Shopping Centre containing the luxury and larger type of shopping facilities, and finally a business and commercial centre for the office buildings.

(6) *Rural Zone.*—The growth of the city should be limited in extent and outside these limits, the land zoned for agricultural use only. These limits should be such that the country is within easy access of the city population.

After the production of the outline master plan, detail planning of the various sectors of the city should proceed.

Having prepared the plans, their achievement in fact remains a difficult problem, a problem which has been simplified to a limited extent by the extensive bomb damage suffered by many of our larger cities. The main difficulties arise from the very high values placed on urban land, the multiplicity of small ownerships in the city area, the lack of enabling powers and a central government lead in the form of a National Plan. A National Plan is a first essential for satisfactory city planning; the local planning authority must know whether the city will increase, remain static,



or decrease in size and this will be largely governed by the direction of industry to or from the neighbourhood. Secondly the Regional Plan based on the National Plan will have a profound effect on the disposition of the town within the region.

High land values, compensation and betterment, and many small owners are intimately connected and a number of suggestions for dealing with this problem have been put forward, e.g. the pooling of ownerships and redistribution on a share basis, Government purchase of development rights, the national or municipal ownership of the land. The latter appears to be the better method from the standpoint of the general public and would ensure that future development was considered primarily from the aspect of communal instead of individual interest. Municipal enabling powers require extension ; individual instead of communal rights have far too much protection under present law, compulsory purchase powers should be extended and large low-interest-bearing loans be made available to local authorities.

It will be necessary to provide and develop land to house the factories at present sited in the central areas and temporary hostels will be needed in the interim period for housing the population from the central slum areas and those disturbed during the course of redevelopment.

This essential redevelopment and decentralisation will necessarily be a long-term undertaking, but it can be done successfully if given the goodwill of the public and a National Plan, a Regional Plan and the City Plan.

# THE REDISTRIBUTION OF POPULATION

by

A. E. SMAILES, M.A.

A NATIONAL Plan of social and economic reconstruction must include schemes for the regrouping of settlements, considered with reference to various pressing problems such as Unemployment, the Special Areas, War Devastation, Slums, and Rural Depopulation. It is highly desirable, moreover, that these problems should no longer be considered separate, but should be integrated and embraced by a unified National Plan.

Since there is every likelihood that for some time to come the total population of Britain will remain practically stationary it follows that any changes in population distribution can be effected only by movement of people from one locality to another, so that an increase in one place is balanced by a corresponding decrease in another. There are thus two complementary geographical aspects of the problem of planning redistribution which must be brought together and correlated, viz. :

- (a) The location of sites suitable for the development of new settlements (see page 66) and
- (b) The present location of the population for which it is necessary or desirable to provide schemes for resettlement.

It is obvious that some communities are at present in a much more satisfactory social and economic condition than are others, and that there are some which in any plan of reconstruction must require drastic measures of treatment. A necessary preliminary to the planning and execution of any redistribution of settlements must be the investigation of the numbers and distribution of the population which would be affected directly, and the nature of the social and economic needs of the communities concerned. As a basis for such an investigation it is suggested that an attempt be made to recognise and locate as precisely as possible the settlement-groups of communities that fall into the following categories :

- (1) Communities living where there is no longer any basic occupation adequate to support them, and no possibility of carrying on new industries without permanent subsidisation. These conditions mean unemployment for a large section of the group and the generally distressed condition of the community—without hope of rehabilitation. The only reasonable course of action would appear

to be a planned evacuation spread over a period of years and accompanied by resettlement schemes.

Such communities are in the main associated with decayed extractive industries. While many of them are to be found in the Special Areas, they are not confined to these areas and include more scattered communities in other parts of the country; and by no means the whole of the Special Areas fall into this category. Their distribution within the Special Areas and over the country as a whole clearly requires careful examination and definition.

- (2) Communities approaching or in danger of falling into the condition of Category (1) unless corrective measures are applied. They too are for the most part communities whose livelihood is based upon extractive industries, or in a few cases possibly upon some industrial establishment whose future is insecure. In any case they are single-industry settlements, extremely ill-balanced and liable to have the whole basis of their life destroyed by the process of mineral exhaustion or by economic adjustments arising out of depression or rationalisation.

According to the special conditions of the individual case preparation must be made for eventual evacuation or the basis of the existing community life must be broadened.

- (3) Communities based upon some activity that is rooted in the spot, but which require balancing and diversification of their occupational structure.

Populations which have gathered round the sites of the fixed industries and which are essential to their continued activity obviously cannot be moved; they are fixed elements of the settlement pattern which the planner must respect. Yet it is especially these communities which suffer from the social disabilities of highly specialised functions and from the economic vicissitudes which arise from their industries being particularly susceptible to cyclic depressions.

These communities are engaged in industries basic and vital to the life of the whole community and, since they are immovable, their maintenance in a healthy condition where they are is a responsibility of the community as a whole. Unfortunately it is often economically difficult to attract new industries to these sites; yet it may be socially desirable to offer positive economic inducements to establish new industries there, so as to broaden the basis of life.

- (4) Communities at present prosperous and growing, whose

further growth is not undesirable provided that there are safeguards against economic and social maladjustments.

These communities are advantageously placed for allowing continued growth of their existing functions and/or the attraction of new industries and services, with consequent immigration. They are usually located in situations possessing well-marked nodality, a feature which is ultimately responsible for their prosperity, through the increasing concentration of centralised services at these points and the development of modern light industries (in the location of which the marketing factor has become increasingly important).

Many regional and district centres of various grades fall into this category. Since they are closely integrated with the surrounding countryside and endowed by their nodality with a tendency to diversity as opposed to specialisation of occupations, they afford some examples of the healthiest social environment in Britain. It is necessary, however, that changes in their size and social structure should be watched, and guided by conscious planning, lest new problems be created for the future.

- (5) Conurbations overcrowded in parts and/or overgrown as a whole, which are badly in need of decentralisation and dispersal of industries and commercial functions, and industrialised areas where further extensions and intensifications of urbanisation are undesirable.

The locations of these major concentrations in the settlement-pattern of Britain are well known, but their individual problems and planning-needs require further detailed investigation, especially with regard to the possible scope for internal readjustments and decentralisation on the one hand and the opportunities afforded for wider dispersal by the nature of the industries and services.

War-devastated districts may be expected mainly to fall within these large urban groups, often in the most congested quarters, and offer opportunities for more radical changes than would otherwise have been considered practicable. The ground has literally been cleared for re-planning. Among such districts it will be necessary to distinguish between :

- (a) Those whose homeless populations and derelict establishments should be moved elsewhere because it is unwise, either in their own interests or in the wider interests of the community as a whole, to re-establish them in their old quarters, and

- (b) Those whose populations must be re-housed locally, even if not on the actual pre-war sites.

A knowledge of the distribution and extent of these war-devastated districts will be needed by the planner as important material to be taken into account in the formulation of plans for post-war reconstruction ; but during the war there are obviously great difficulties in the way of obtaining the information—both because these districts are being added to so long as aerial bombardment continues and because of the military importance of keeping secret such collected information of war damage. At the same time it is of the greatest importance that this question should not be regarded as a separate problem, still less as several local problems for the areas concerned, but that it should be dovetailed into a National Plan of reconstruction.

- (6) Communities living in rural districts which are especially in need of a denser population to support adequate services and amenities for the inhabitants to enjoy a standard of life that is not deteriorating relative to that of the nation as a whole. Under present conditions such areas (e.g. parts of the Scottish Highlands) are socially distressed, becoming more so as depopulation continues.

There is great need for exploring every possibility for the further development of the resources of these regions, and of examining the prospects of new industries in order to attract population. A case may perhaps be made for a moderate degree of subsidisation of certain types of employment in these regions. (Vide P.E.P. Report on Location of Industry, p. 204.)

There remain rural areas where a certain measure of regrouping would provide adequately for the social needs of the inhabitants, but which in many cases might accommodate infusions of new populations to the social advantage and economic profit of their present occupants. Along with Category (4) these areas may be expected to figure prominently in schemes of resettlement of urban populations.

Investigations carried out within the framework outlined above would point the way to planning by providing the pieces which when rearranged must fit together as a coherent whole. The nature of the necessary readjustments would appear more clearly once this analysis had been carried out, but would probably be made within a regional framework, though not so rigidly as to preclude inter-regional adjustments where these are called for, e.g. in dealing with the special problems presented by Greater London.

# THE REDISTRIBUTION OF SETTLEMENT

## THE DEVELOPMENT OF EXISTING SMALL TOWNS

by

ARTHUR E. SMAILES, M.A.

UNTIL the Industrial Revolution the growth of inland towns was largely a simple expression of their nodality. In the words of Vidal de la Blache, "Les routes ont fait les villes." Towns grew in size as they developed during the course of centuries as foci of the road-system. Such towns were intimately associated with the life of the surrounding countryside, for which they acted as collecting or marketing centres, as crystallising points of social life, and as transmuters of contemporary culture. They drew their life-blood alike in men and in trade from these surrounding rural areas.

With the dawn, however, of what has been called the "palæotechnic age",<sup>1</sup> new siting factors came into prominence quite independent of nodality. They even asserted themselves often in spite of the absence of any existing measure of nodality. It was the location of coal and iron-ore supplies that now attracted settlement, new aggregations of which gathered on the coalfields. The attraction of the coalfields was the more compelling in that they were also the chief fields of supply of iron-ore during the early phases of the new age. Further, a new medium of transport, the steam locomotive, created a new agent of nodality, the railway. Partly because of its more stringent gradient requirements, its field of operation was more restricted than that of the older channels of traffic and its conferment of benefits more discriminating. By the all-assertive requirements of the new industrial régime settlement was impelled into a new pattern, in which the distribution of coal-mines and the railway network were the dominant controls. To be ill-placed in relation to these meant stagnation. Population, multiplying fast, swarmed to the coalfields and to sites nearby on the railways where coal could easily be obtained and industries concentrated. The new settlements were in appearance as they were in fact extensions of the coal-mines and steam-driven factories that symbolised the new age. Offspring of industrial establishments and not of the agricultural land, they massed together as alien intruders in the countryside,

<sup>1</sup> Based on the utilisation of coal for smelting iron and for generating steam power.

creating there a new environment of their own. Wherever it might be, this environment was the same in its dreary ugliness and sordid denial of values other than economic gain. The new settlement-groups grew completely divorced from the rural countryside whose amenities and life they despoiled.

While some old-established towns were so placed as to be able to benefit quantitatively from the new stimuli, and so to grow at accelerated speed, the promoters of the new enterprises often looked with more favour on new sites. Here they could operate their machines free from the trammels of social restrictions which had protected human life and skill in the age that was passing. Many old towns were thus left to stagnate, for they were off the channels of the new life. In another way, too, the new industrial organisation accentuated their decline. Its products caused the handicraft industries that had flourished in and around them to decay and disappear. They became relics of the past, sleepy country towns playing no part in the dynamic surge of the new industrialism, and such they have remained for the most part until our own day.

In almost all its major lineaments the palæotechnic pattern of industrial location and population distribution had been established by the middle of the nineteenth century. During the latter half of the century the chief modifications of the pattern were caused by the tendency of the iron and steel industry to shift from the coalfields to tidewater and to new orefields, and by the exploitation of concealed coalfields. Industries and workers became more and more concentrated in the industrial towns, and industrialisation proceeded increasingly to accentuate the distinction between urbanised and still rural districts. The divorce of industrial workers from contact with rural conditions became ever more complete. Industrial groups coalesced to form the great conurbations which are such an outstanding feature of the present-day distribution of population, and whose presence and structure present the crux of many of our most pressing social problems.

Such has been the legacy bequeathed by the nineteenth to the twentieth century. But coal-mine and railway focus are no longer dominants in the patterning of our economic and social life; in the twentieth century they have become recessive, and meantime new mutations have appeared. Within the last generation motor transport has revived life on the old English roads, rejuvenating centres possessing road-nodality. The revivifying influences have worked selectively, and their benefits have not been felt equally by all the old market towns, for the conquest of distance has made possible an increasing centralisation of functions and services. In this process the momentum afforded by initial size,

as well as natural advantages of position, explain the differential growth of the old-established towns as district-centres for the collection and distribution of commodities, for the organisation of administration, and for the provision of social services. Contemporaneous with the developments brought about by the new coursing of life along the road arteries of the country, electric power and its distribution by the grid system have freed industry from direct subservience to coal, and from being fettered to its channels of distribution, the railways. To a degree previously unknown, industry is becoming mobile, and a new industrial pattern tends to be superimposed upon the old.

While the largest concentrations of population have attracted to themselves a large proportion of the new industrial development, a tendency to decentralisation has become evident. Not only does the location of the new factories tend to be peripheral in relation to the conurbations, but also some of the old towns, brought by modern communications within their orbit, are becoming industrial satellites. Neotechnic industries have been grafted on to their old structure as, for instance, at Guildford and Bedford.

Unfortunately, the opportunities latent in these recent technical developments have, to a large extent, not been widely recognised, much less grasped and translated into fact. The technical equipment, offering the means of building a new organisation of society in terms of a better distribution of population, has simply been harnessed in subjection to the old attitudes and restricted objectives. Indeed, it has often been misused not merely so as to aggravate defects of the old spatial organisation but also to create new ones. An increasingly rapid invasion of agricultural land and destruction of the beauty of the country by the spreading tentacles of urbanism, the spread of the desocialised environment of suburbias, and the creation of ever more extensive tracts of nondescript "rurban" districts, offering neither the amenities of country nor of city life—these are so far the most patent results. The limitations of its technical equipment gave some excuse for the massing tendencies of the nineteenth century, if not for the forms they took, but this no longer holds to-day. We can only regard the major effects to date of the neotechnic régime on the spatial organisation of life as yet another example of the lamentable failure of man's capacity to develop the organisation for living the good life in pace with his control of the necessary power over his environment for the purpose. It is an example of what Professor John Macmurray has so succinctly described as the lag of cultural development behind that of civilisation. "The development of the modern world is primarily a development of civilisation—a continued increase in the capacity to control the conditions of



human existence. It is not primarily a development of culture or of the capacity to live a truly human life."<sup>1</sup>

It is in the light of this background of the past, and these trends and unrealised opportunities of the present that our planning for the future must be directed. While it is not suggested that suitable new sites for towns have been exhausted in Britain, it does at least seem certain that planning any considerable re-location of industries, with its accompaniment of shifting workers and their homes, must involve the further development of many sites that are already partly occupied. This is an inevitable consequence of the high density of population and the maturity of settlement in this country, where the frontiers of settlement have for many centuries been stable, with the exception of a few more recently colonised tracts such as the Fenland.

Apart from the necessity of looking to established towns it would seem that many of the numerous old-established small or medium-sized towns which exist up and down the country can and should play a very important receptive rôle in the planning of the redistribution of settlement. They offer certain real advantages for future development both over cities that are already large and over completely unoccupied sites.

Among the smaller urban groups, with less than 50,000 inhabitants, are many industrial creations which scarcely possess any urban attribute other than size. Certainly they are for local government purposes "urban districts", but they do not by structure or by functions merit consideration as towns or cities, and so far from offering an attractive and desirable setting for industry and residence they are in many cases both economically and socially repellent. Apart from these monstrosities there is also a special class of health and pleasure resort towns, a majority of which fall within this limit of size.

Most of the other towns with less than 50,000 inhabitants are survivals from the pre-industrial age, which have failed, at least until recent decades, to take any considerable share in industrial development. They are small enough to allow further expansion to the advantage of their existing population and that of their surrounding district, for growth would mean ability to support a fuller range of services, and wider opportunities for a healthy and social life would be at the disposal of the local inhabitants. At the same time they are already large enough to possess at least a nucleus of services and institutions upon which to build. They have traditions, and the germs of civic consciousness already exist, so that the extremely difficult task of creating *de novo* corporate life and institutions and a sense of community is obviated.

In the second place they are already integrated with their

<sup>1</sup> J. Macmurray, *Makers of the Modern Spirit*.

surrounding countryside, since they function as district centres. It is essential that new urban groups should not be parvenus, and that new tensions between town and country should not be created. In that the population of overcrowded conurbations needs to be scattered, and therefore assimilated into country districts, the small towns would seem to be best fitted to act as assimilators. They are perhaps the most effective vehicles by which the new elements can be introduced into the regional life and organisation. There is, however, another beneficial aspect of their proposed development. Besides relieving the congestion that now exists in the overcrowded conurbations and restoring to the evacuees their contacts with the countryside, the development of the small district centres that are scattered over the country would be a valuable corrective of the drawbacks of the modern tendency towards a metropolitan organisation of our society. There is much substance in the charge that most of the fruits of civilisation are being hoarded away from rural dwellers. Many social scientists see in a balanced regionalism the key to a restoration of equilibrium between the benefits offered by town and country life. "Regional planning does not mean the planning of big cities beyond their present areas ; it means the reinvigoration and rehabilitation of whole regions so that the products of culture and civilisation, instead of being confined to a prosperous minority in the congested centres, shall be available to everyone at every point in a region where the physical basis for a cultivated life can be laid down."<sup>1</sup> What more important contribution to this end can there be than the development of the small district centres ? Their expansion would increase the density of population of the districts in which they are situated to a level compatible with the existence of many services, both economic and social, at present denied them. Services which ought to be within reach of all, but which at present cannot be supported because too few people live within their effective range to give their presence economic justification, would become available in the enlarged centres, and thereby would be accessible to the whole district.

Finally, these district centres already possess some measure of the primary basis of urban development, namely, nodality. It is no exaggeration to assert that it is the most important requirement for the effective functioning of a modern urban group. Indeed it is to-day assuming added significance in the localisation of industry through the fixing power of other factors having been relaxed. In urbanism, moreover, nodality is a geographical value that is persistent and relatively permanent as compared with other values called forth by the prevalence of some particular

<sup>1</sup> L. Mumford, "Regions to Live in," *Survey*, Vol. 54, No. 3, pp. 151-2.

culture or technology. It is true that nodality is not always a natural attribute, but may be induced in a highly artificial manner. In the nature of things nodality is a function of route-systems, and these are man-made. As with all other features of the cultural landscape, "la nature prépare le site et l'homme l'organise pour permettre de répondre à ses besoins". By way of example it is sufficient to cite Sheffield, which to-day possesses considerable nodality; it is the focus of five railway lines and some ten first-class roads. Yet little more than a century ago it lay in a Pennine cul-de-sac on a side-track, entirely off the channels of life and circulation. The development of industry gave it size and economic importance, in the train of which came the construction of lines of communication to meet the traffic requirements. Nodality was achieved, however, only by overcoming the very considerable natural obstacles, and was a costly acquisition. Direct railway connections with the opposite side of the Pennines necessitated the construction of long tunnels, the lines have heavy gradients which add to the working costs, and the corresponding roads have high, exposed and sometimes snow-bound moorland tracts well over 1,000 feet high. Although this example emphasises perhaps in somewhat extreme fashion the difficulty and cost of inducing a nodality for which nature has not prepared the facilities, the fact remains that any nodality that has to be provided artificially imposes a certain burden of cost, which is justifiable only when there are reasons for preferring a particular site that outweigh this handicap. Accessibility, which in any given locality is especially a property of the nodal centre, is an essential for successful industrial operations which if it did not already exist would have to be provided. The towns under consideration are road nodes and most of them are adequately served by rail. They do not always possess railway nodality, though some do, while others are situated on main lines some distance from the coalfields. An important distinction must be made, however, between those which are accessible by rail as well as by road transport, and those which are undoubtedly handicapped by being some distance from a through railway line. The former class at least are ripe for industrial development. As decentralisation may be expected to take place to some degree even if the present *laissez-faire* economy should persist, some at least will be the natural centres of attraction for the scattering industries. All the more necessary is it therefore that their growth should be planned and consciously directed in the interests both of the locality and the nation, if the evils of haphazard urban expansion are to be avoided. In so far as decentralisation or dispersal of industry is planned as a necessary measure to relieve the congestion and over-development of the conurbations these small

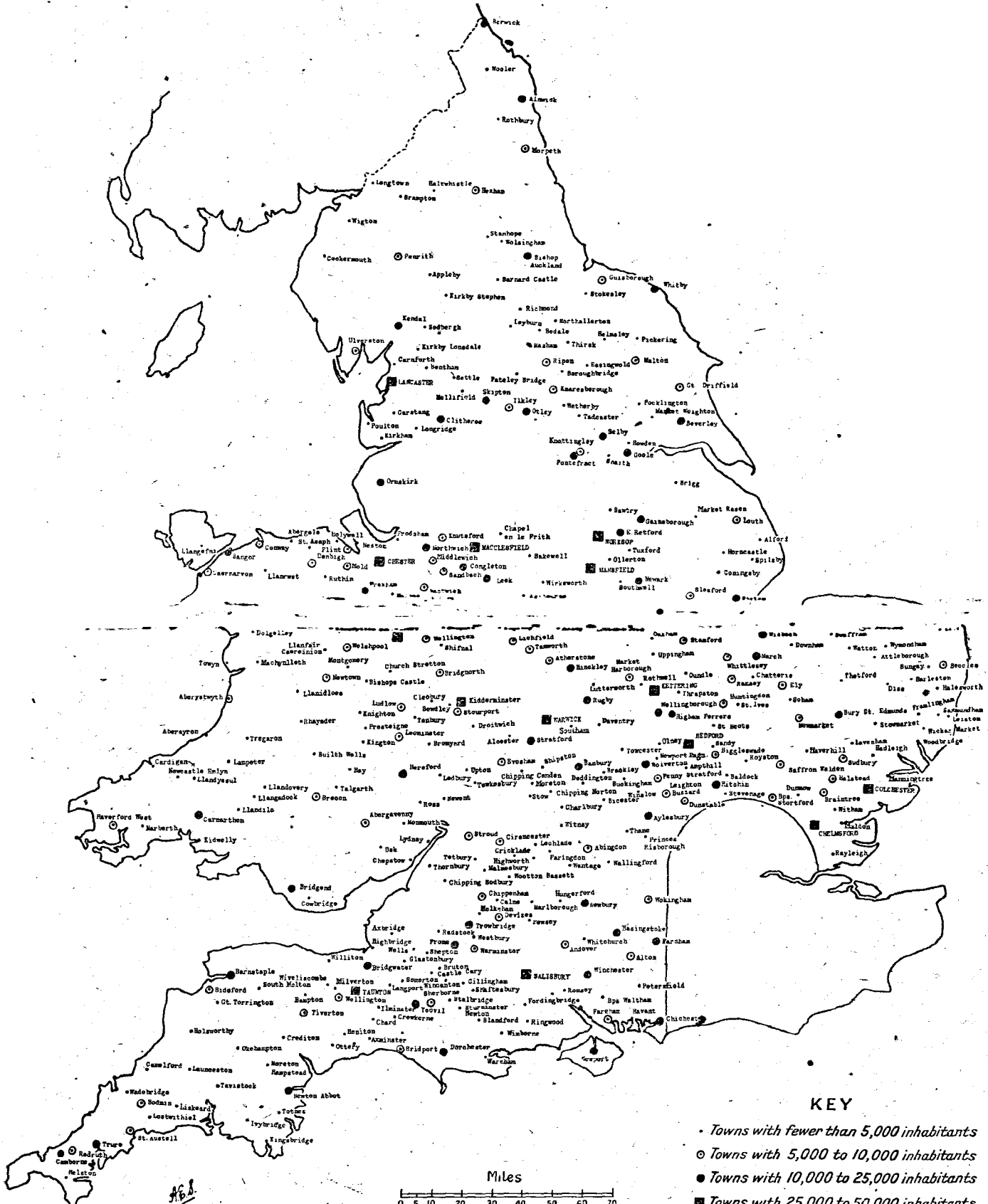
towns are specially appropriate to act as receiving centres, for they have a prime economic requirement ready-made.

It does not follow that their expansion must involve a swelling of the urban area with the present town and carrefours as the core. On the contrary, the necessity of avoiding traffic congestion in the centre will often preclude this form of development. The disposition of housing—and industrial—quarters alongside or even detached, some little distance away, may be the ideal form; indeed, the new town may quite conceivably be polynucleated. The really significant consideration in this respect is to take full advantage of ready-made facilities pertaining to the situation in proximity to an existing node of communications. Certainly it will often be desirable to make some local adjustments of the highways as they approach convergence so that the lay-out of the planned town shall meet the modern requirements of offering the Highwayless Town and the Townless Highway.

While the general features and advantages for development that have been dealt with above would appear to belong to a class of towns, it must be emphasised that from one town to another there are wide differences in every respect. Individual circumstances and conditions must in the final analysis always determine the appropriateness and potentialities for development. Planning must therefore always take account of the particular conditions of location—position in relation to the existing concentrations of population whose structure is to be loosened, position in relation to neighbouring centres that exist or that may be planned, so that regional development may be balanced—as well as to such local considerations as the accommodation offered by the physical site, the present size, lay-out, functions, constitution of the population, and state of civic development.

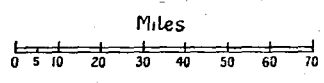
The accompanying map may serve as a basis for such further investigations. It shows the distribution of towns with fewer than 50,000 inhabitants, excluding "urban districts", which are part of the conurbations, as well as some purely industrial groups, and others that obviously fail to offer the advantages for development which have been described above. It is possible that some small settlement-groups, which in their present functions lie on the border-line of urban rank, may have been omitted. The map, however, probably errs rather on the side of including too many groups, and further sieving will no doubt be necessary. For a variety of reasons the desirability and wisdom of further industrial development in south-east England (Kent, Surrey and Sussex) is doubtful, and the area east of a line from Maidenhead to Selsey has been left blank. Similarly no towns north of the Thames within a 25-miles radius of Charing Cross have been included. The small towns which belong to the special class of

resorts, either seaside or inland, have also been omitted, although in some cases there are good grounds for investigating the compatibility of some planned industrial development with their present functions. The majority are by nature well served by communications and accessible to large markets. If industries could be added to their structure and lay-out without impairing their amenities as resorts, they would relieve the present dependence on seasonal trade and at the same time provide more people with opportunities of sharing the amenities these resorts have to offer, not merely for brief holiday periods but as the environment of their work-places and homes. Obviously no general rule can be laid down ; the desirability of the combination depends upon the individual case.



**KEY**

- Towns with fewer than 5,000 inhabitants
- Towns with 5,000 to 10,000 inhabitants
- Towns with 10,000 to 25,000 inhabitants
- Towns with 25,000 to 50,000 inhabitants



[See page 222.]

## ILL-BALANCED COMMUNITIES— A PROBLEM IN PLANNING

by

ARTHUR E. SMAILES, M.A.

THE betterment of economic and social conditions in communities that are at present occupationally ill-balanced must be one of the main tasks of national planning and post-war reconstruction.<sup>1</sup> Leaving aside rural areas where the interest and welfare of the community are overwhelmingly bound up with farming, we shall here consider ill-balanced industrial communities with respect not only to the problems they present but also their geographical distribution and principles governing appropriate planning measures.

While it is perhaps impossible to lay down an optimum constitution for a community or even an absolute limit beyond which the proportion of people engaged in any single industry or closely-allied industry group must be considered excessive, it can confidently be assumed that where a proportion of more than one-third of the total workers of a community are concentrated in a single industry there is manifest lack of balance. On this basis an attempt has been made to determine the distribution of these communities, and they are shown on the accompanying map (Fig. 1). It will be seen that they include many of the cotton and woollen towns of Lancashire and the West Riding, the footwear towns of Northamptonshire, the Potteries, some towns dependent upon iron and steel, shipbuilding, tin-plating, or chemical concerns, or upon railway works or naval dockyards, and a few other scattered manufacturing towns.<sup>2</sup> But by far the commonest type of ill-balanced economic and social structure represented in Britain is the mining community. It is also the extreme type and shows the attendant disadvantages in most acute form. The typical colliery settlement has more than half its occupied population engaged in mining and in many cases the proportion rises as high as two-thirds. This means complete dependence upon one industry, and not infrequently upon a single unit of the industry. The consequences in time of depression are disastrous, as is only

<sup>1</sup> Vide E. G. R. Taylor, "Occupational Balance in Towns—A Factor in Planning", *Town and Country Planning*, Vol. IX, No. 34 (1941).

<sup>2</sup> If metal-working industries were considered as a unit-group many centres in the Black Country, as well as Sheffield, would also come into this category; but it is the amazing diversity of trades using metals as their raw materials which is the outstanding feature there.

too well known from the experience of the past two decades. For years the colliery districts have been "black spots" in regard to both the severity and intractability of unemployment. What are variously known as the "distressed", "depressed", or (euphemistically) "special" areas are all mining districts or districts of extreme industrial specialisation.

Even under conditions of economic prosperity such a preponderance of interest is highly undesirable, although the evils do not attract public attention as does the necessity of disbursing large sums of public money in time of depression. The social life of communities so lop-sided in constitution cannot be healthy. Vocational opportunities for adolescents are so completely lacking in variety that it is only inevitable that the natural tastes and talents of a large proportion are denied a chance of fulfilment, and all that this means for the contentment of mind and happiness of spirit of the individual. Frustration must indeed be regarded as a natural product of the psychological environment in such a community.

Another serious social weakness is the lack of significant representation in these communities of most strata of society, and especially of those sections most productive of social leaders. Manual workers heavily outnumber black-coated workers, usually in a ratio of more than four to one, whereas the ratio for the nation as a whole is less than three to two. All the social life must rely upon the contributions made by individuals drawn from a single preponderant class, and there is little opportunity for the development of a wide range of social activities. Not merely is the working-class interest unleavened by any appreciable element of professional people or black-coated workers; what is worse, the working-class group itself tends to lack the diversity of outlook and interest that can spring from diversity of occupations. No wonder that the sterile stereotype of social structure in the mining settlement is something without parallel except in the twentieth-century suburbs and housing estates of the great conurbations.

The segregation of a large proportion of the nation's million miners and their dependants in settlements where no other activity is effectively represented has too often meant that they have been forgotten and neglected by the community as a whole. Partly on account of a general lack of awareness of the seriousness of the conditions of life which is perhaps only natural in the absence of immediate physical contacts, and partly because of a fatalistic tendency to accept the conditions as inevitable accompaniments of mining, and therefore to regard the problems as insoluble, the social conscience has been slow to awaken to a sense of responsibility for creating a healthier physical and social environment for the miners. Such neglect, however, cannot be



allowed to continue, and one of the crucial tests of the efficacy of economic and social planning must be its capacity to solve such problems as those presented by these ill-balanced mining communities.

It must be pointed out, however, that the single-industry community does not occur throughout the coalfields. It is not an inevitable and invariable accompaniment of mining, although there is certainly a tendency for it to be typical. The presence of other industries alongside mining can and sometimes does give a better balance, as for example in parts of the East Pennine and Lancashire coalfields where in some communities textile industries dovetail with mining. Nevertheless, the manufacturing and mining communities even here are to-day much more distinct than is commonly supposed.

Only manufacturing industries, moreover, are effectively able to redress the balance of employment in mining districts, for they alone give an adequate potential of concentrated employment. Agriculture, even in its most intensive forms, is an activity too diffused in area to count as a significant source of employment in a region of intensive mining activity. The process of removal of a substratum from an area involves so vastly greater an expenditure of human energy while it is in progress than does the cultivation of the surface of the same area. As a general and real solution of the problem, combination of agriculture with mining, which is sometimes suggested, is quite inadequate. It could merely serve as a palliative, and could not touch the core of the problem of employment balance, for agriculture can never employ within a given area more than an insignificant fraction of the density of population characteristically associated with modern, efficiently organised mining. The combination of agriculture and mining on comparable terms belongs to an era of industrial organisation that is past; its survivals are archaic.

To reject the idea of agriculture as a solution of the particular problem of balance of employment in mining districts is not to cast doubt upon the desirability of an active policy of providing smallholdings or allotments for miners who desire them. The merits of such a policy lie elsewhere, in its provision both of a valuable recreational interest and of an important local supply of fresh food.

There remain only the alternative possibilities of transferring population from the ill-balanced communities to districts where a better balance obtains or of bringing other industries to the mining districts to improve the economic stability and social structure of the existing communities there. In relation to the applicability of these alternative solutions two features of mining are of fundamental importance. Mining is a fixed industry, and,

as a form of destructive and not of conservative exploitation of natural resources leading ultimately and inevitably to their exhaustion, it is an activity which in any locality must be of limited duration. Since the industry is immobile, and at the same time essential, being concerned with the production of a commodity absolutely vital to our modern industrial civilisation and, so far as can be foreseen, likely to remain so as the major ultimate source of power, there can be no other general solution to the problem of the mining settlements than to seek to improve conditions of life there. In this connection, however, the other salient feature of mining has an important bearing upon any planning policy. It would be foolish to establish new industries at sites chosen merely because of the presence of colliery settlements if mining is likely to cease there in the near future. Unless the sites in themselves are attractive for other industries and for residence the addition of new industries would merely lead, once mining had been outlived, to an unnecessary perpetuation of communities in unadvantageous settings. They would become unfortunate examples of geographical inertia.

Planning for our coalfields must take account of this, for in parts mining has now been carried on, even intensively, for a long period and the stage of exhaustion has been reached or is imminent. The northern ends of the South Wales mining valleys<sup>1</sup> and the south-western corner of the Durham coalfield<sup>2</sup> are examples,<sup>3</sup> where mining is in advanced stages of its life-history, without possibility of rejuvenation. There are not a few examples in these districts of derelict mining settlements where there can be no hope of resuscitation.<sup>4</sup> No doubt the abandonment of workings has in many cases been precipitated by economic depression before the coal supplies have been completely exhausted. But there is no prospect of revival now—the resources that remain could not justify the outlay that would be necessary to re-establish the industry. Yet communities continue to exist around these abandoned pits, depending upon State provision for their maintenance; their mainstay is the “dole”. Even where it has been possible, as in some of the South Wales cases, for some of the inhabitants to find work within reach of daily travel, it is usually undesirable that the old settlements should persist as “dormitory” areas. The travelling involved represents a considerable tax on

<sup>1</sup> Vide H. A. Marquand, *Second Industrial Survey of South Wales*, 1937.

<sup>2</sup> A. M. Hedley, *Mineral Survey of Coal-mines in South-west Durham*, 1936. A. E. Smailes, “Population Changes in the Colliery Districts of Northumberland and Durham”, *Geogr. Journ.*, Vol. XCI, No. 3 (1938).

<sup>3</sup> So is the Cleveland ironstone field. Its zenith as a producing area was reached before 1890, within forty years of commencement of operations, and the economically workable ore is rapidly approaching exhaustion.

<sup>4</sup> For detailed and graphic descriptions of some of these settlements in South-West Durham, see T. Sharp, *A Derelict Area* (Hogarth, 1935).

both the worker's wages and his leisure time, and housing conditions, even by low coalfield standards, are quite commonly worse than usual in such settlements because the dwellings are older. Not least important is the fact that the atmosphere of a graveyard pervades these scenes of defunct industry.

To the problem of the continued presence of such groups there can be but one answer—a systematic and planned evacuation of the inhabitants to places where there are opportunities for their absorption into gainful employment. There is no reason to believe that, granted favourable opportunities of securing employment and family accommodation, mining populations are not naturally mobile to-day as in the past, though complete uprooting of Welsh miners from the very special social and cultural atmosphere of Wales is perhaps another matter. A policy of transference that is boldly conceived and thoroughly organised need not involve severing the majority of the ties that are the main obstacles in the way of migration. For these ties which make people loath to move, and if moved to hanker for a return "home" in better days, are quite predominantly social in character—the ties of family, kindred, and social or religious fellowship. They are much less links between person and place than between persons; and migration can be successful when the conception of home, an idea which is social rather than geographical, is transferred from one place to another. This is enormously facilitated when the social group, not merely the individual, moves; and it is in this respect that the transference envisaged differs radically from the limited and individually selective measures of State-directed movement to date.

Evacuation of derelict sites must be accompanied and followed by the tidying and reconditioning of the scarred landscape that now bears the excrescences of industry and habitation. Not merely is this imperative on æsthetic grounds, but also because the land is too precious to lie waste. Its reclamation for agriculture or for recreational space is called for in the interest of the community, and the climax use may perhaps in some cases be approached best by way of an intermediate stage of afforestation. What is important, however, is that careful investigation of the land-use potentialities and methods of reclamation of tracts that have been laid waste by industry and then abandoned should be recognised as an aspect of planning that we cannot afford to neglect.

Over a very much greater proportion of the coalfields than can properly be regarded as yet worked out or even in a penultimate stage of exhaustion there exists to-day a population considerably in excess of the actual or conceivable future requirements of the coal-mining industry. With continued improvements in mining

technique and the increasingly rational organisation of the industry its employment capacity has been shrinking in relation to its output, and there is every indication that this trend will continue further ; so that even without allowing for any permanent contraction in the market for coal there must still be an increasing surplus of workers. In fact, however, there has been a very considerable reduction in markets, and especially in export markets. Thus a large surplus of workers exists in most mining districts who can never hope to be absorbed into the industry again.

Transference of this redundant population may be considered advisable and in the light of the circumstances of some districts, e.g. the congested valleys of mid-Glamorgan, there can be little doubt of its expediency. With very inadequate control and little conscious direction, migration from these districts has been in progress for some time past. But unless it is planned and carried out comprehensively with due attention to all its social repercussions <sup>1</sup> migration creates rather than solves problems of modern industrial society. Further, even if transference should produce a correct balance between the available and required labour supply, the lack of equilibrium in social and economic structure of the mining communities would remain unsolved. This problem alone makes industrial diversification imperative ; and a happier and more generally satisfactory solution of unemployment than draining away the most enterprising members of the community, with progressive impoverishment and undermining of the bases of all services and institutions in mining districts which have passed their zenith, would be the recruitment of the surplus workers into new industries. In many places where it is to-day a sick industry mining will be a long time a-dying, and it is no less morbid for the life of a community than for that of the individual to prepare only for death once middle-age is reached.

Recognising the need for introducing new industries into the structure of mining districts, it becomes necessary to examine the opportunities of such a policy. The experience of the past two decades does not suggest that the existence of cheap coal can any longer be considered a powerful magnet for attracting industries to the coalfields. In the present age of electric power, which can be cheaply transmitted and readily made available where it is required, the coalfields play a far less important part in the localisation of industry than in the past. Even for a heavy industry such as iron-smelting, now that the ores used are imported or obtained from other geological formations, location on a coalfield is no longer such an advantage for smelting as when

<sup>1</sup> A. D. K. Owen, " The Social Consequences of Industrial Transference ", *Soc. Review*, Oct. 1937.

local coal measure ores were used. Moreover, the large-scale use of ironstones of low metal content, combined with great economies in the use of fuel in smelting, have caused the balance of advantage for assembly of materials to shift from coalfield to orefield. In the case of the Cumbrian ports, in addition to the availability of cheap sea-transport, both coal and iron-ore are at hand, and for the primary processes of metallurgy these sites are soundly located in terms of present-day costs.<sup>1</sup> The other coalfield centres of iron and steel production have not the same justification; they are survivals, mere examples of the inertia that attaches to the sites of industries that require expensive provision of immovable capital equipment. The current balance of localising factors would never warrant on purely rational economic grounds the establishment of works on the old sites.

In South Wales the industry has now deserted its original sites on the northern edge of the coalfield<sup>2</sup> and has moved nearer tide-water. It is mainly engaged in providing sheet for tin-plating and galvanising, and is properly regarded as simply the preliminary stages of these industries. Yet it has been suggested that a rationalised tin-plate industry could be carried on more economically near the Midlands ore-fields than near South Wales ports. The industry has far outgrown the home market and become dependent upon exports for the disposal of a large proportion (roughly two-thirds) of its production capacity. South Wales' position in these export markets has been undermined by the rise of protected home industries in the countries concerned. Thus, although the home market is expanding, the industry has been in a depressed condition in recent years. As it provides the only large alternative source of employment to coal-mining at present available in the South Wales coalfield, the utmost efforts are needed to preserve the industry there, and to diversify the occupational structure at its centres in the interests not only of the populations attached to this shrunken industry, but also of the local mining populations.

Of local raw materials the coalfields possess in many parts suitable clays for bricks and refractory materials, and coal itself is a raw material from which many useful by-products are derived. Opportunities for the further development of such industries in coal-mining districts clearly call for investigation followed by action.

The greatest asset, however, that the mining districts can offer for new industries is undoubtedly their supply of labour, especially of the female labour required in quantity by so many modern light industries. This is of course a corollary of one of the

<sup>1</sup> G. H. J. Daysh, *West Cumberland: A Survey of Industrial Facilities*, 1938.

<sup>2</sup> An exception is the recent re-establishment of the industry at Ebbw Vale.

inherent weaknesses of the structure of a purely mining group, namely the lack of opportunities of work for women and girls. Mining itself is exclusively a male occupation and the proportion of females employed in colliery districts is as a rule exceptionally low.<sup>1</sup> True, there is often an excess of males in the population but this by no means represents the discrepancy, and it is an effect, not a cause, of the paucity of female employment, for the relative proportions of male and female births are not abnormal. Whereas for the country as a whole the 1931 Census recorded more than five million females in employment as compared with eleven and a half million males, a ratio of 44 to 100, in the mining communities under consideration the corresponding ratio usually lies only between 10 and 20 females per 100 males.

There is good reason then to believe that colliery districts probably offer some of the most important untapped reservoirs of female labour left to industry.<sup>2</sup> Light industries which employ a majority of females could with advantage become complementary to the heavy male industry of mining, a form of industrial linkage that would give families insurance against the worst effects of industrial depression. Such a diversified combination is illustrated by Nuneaton where, although more than two-thirds of the employed population are engaged in production, appreciable proportions of the male workers are engaged in brick-making, engineering, textile, and clothing industries as well as in mining; and the relationship between male and female employment corresponds with that of the country as a whole, the male employment being balanced by female work in textile and clothing industries.

With regard to transport facilities sites for new industries on the coalfields are usually well placed, as a close network of roads and railways already exists there. This generalisation does, however, require some qualification in respect of the South Wales and West Cumberland coalfields, neither of which is well situated in relation to large consumers' markets.<sup>3</sup> The barrier belt of highland which lies behind the Cumbrian coast isolates that region on its landward side, and prevents direct contact between it and the main north-south line of traffic to the east. The Welsh mining valleys are side-tracks, off the line of through traffic, and some of them are cul-de-sacs, isolated to the north by the Welsh Highland into which, but not through which, they penetrate. Their general nature as parallel, deep, steep-sided valleys in the highland makes

<sup>1</sup> A. E. Smailes, "The Balance of Male and Female Employment", *Journal of Town Planning Institute*, Vol. XXVIII, No. 4 (1942).

<sup>2</sup> *Ibid.*, p. 155.

<sup>3</sup> See maps accompanying Royal Geographical Society memorandum submitted to the Royal Commission on the Geographical Distribution of the Industrial Population, 1938.

transverse communications exceedingly difficult. Nodality is at a minimum, and the separate valleys have in the past depended almost entirely upon single down-valley lines of contact with the outside world. In the words of the Industrial Survey of South Wales, "The entire arrangement has favoured the exporting of coal rather than the development of industry."<sup>1</sup> It is encouraging to note, however, that modern road-engineering is now improving inter-valley connections and that bus-services on the new roads are in some measure breaking down the isolation of the valley communities from each other.

The introduction of new industries must not be undertaken without full consideration of the types best suited for the locality, and their commercial prospects must be assessed. This question of suitable industries is the one which has perhaps engaged more attention and been more thoroughly investigated than any other aspect of the problem of the Special Areas, e.g. under the auspices of the regional Industrial Development Boards that have been set up, and it need not be discussed at length here. Suffice to say that among suitable industries would appear to be certain branches of the clothing trade, various food manufactures, and the new plastics industries, which seem likely to become increasingly important, and for which a number of raw materials would be available locally,<sup>2</sup> e.g. some are derived from coal-tar.

It would clearly be impracticable to attempt to dispose new industrial units so as to attach some new industry to each individual mining group, nor would such a plan be well conceived to achieve the primary object of effective diversification. The aim should be to provide within reach of the inhabitants of the colliery towns and villages chances of employment in a range of different industries, and this can best be accomplished by the establishment of groups of factories at key-points, each of which would serve and in turn be served by a group of mining settlements. In partially developed form such district centres already exist as the local foci for shopping and entertainment. These functions depend upon accessibility and have naturally attached themselves to the more nodal settlements, which are precisely those best fitted to receive new industries. As service towns they are suitable for further development to cater for needs that cannot be provided in the individual colliery villages, and as new or expanded manufacturing towns they could draw upon the labour supply of the surrounding settlements, and widen the basis of the economic prosperity of the district. Their locations depend upon the pattern of settlement and the system of communications. For the three major coal-fields the accompanying maps (Figs. 2, 3 and 4, page 242) illustrate

<sup>1</sup> *Industrial Survey of South Wales* (1932), p. 6.

<sup>2</sup> *Second Industrial Survey of South Wales* (1937), Vol. III, pp. 254-64

arrangements of centres that might be appropriate for such an improved economic and social organisation.

The mining centres of West Cumberland focus naturally upon the three ports, Whitehaven, Workington, and Maryport, which are the obvious gathering points for manufacturing industries. Except for its north-eastward extension around Aspatria, the coal-mining area is a narrow coastal strip and the great majority of its population lives within four miles of one or other of these ports. The same holds for the iron miners too. Although Cleator Moor is derelict and partial evacuation has already taken place, the iron-ore region adjacent to the southern edge of the coalfield around Egremont is by far the chief centre of production to-day, the Millom and Dalton districts contributing much reduced shares.<sup>1</sup> Workington already is a centre of iron and steel manufacture, but its industrial basis is dangerously narrow, and like Whitehaven and Maryport which are purely coal-mining and -exporting towns, it badly needs more varied industries. The economy of the more outlying north-eastern extension of the coalfield requires broadening by development at its centre, Aspatria, while any developments at the market-town of Cockermouth, just beyond the eastern margin of the coalfield, would be beneficial to the near-by mining villages.

In Lancashire the cotton industry heavily outweighs coal-mining in provision of employment both in the northern or Burnley coalfield and in the eastern part of the coalfield south of Rossendale. The only districts dominated by mining are in the south-west, around Wigan, Leigh, and St. Helens. Yet these towns themselves are important centres of the manufacture of other commodities and in none of them are miners as many as 30% of the workers. Cotton is nearly as important as mining at Wigan and Leigh, while glass is more important than mining at St. Helens. Further diversification of industry in these centres would react favourably on the whole district, and there would also appear to be good prospects for industries established at other sites along the main arteries of road and railway communications that traverse the area, both from north to south and from west to east.

The mining communities of the North Staffordshire coalfield are so closely associated with the adjacent Potteries that they are best considered along with them later.

In the South Staffordshire coalfield the only district now dominated by mining lies in Cannock Chase, north of the Great Bentley Fault which crosses the coalfield from west to east, just north of Wolverhampton and Walsall. The southern part at

<sup>1</sup> T. H. Bainbridge, "Iron-Ore Mining in Cumbria", *Geography*, Vol. XIX (1934).



least of this mining area is within such a short distance of the metal-working province that includes these towns that its economy and society are parts of those of the Black Country. Similarly in the Nottinghamshire section of the East Pennine coalfield the circumstances of life in the mining villages and towns are materially improved not only by the presence in some of them of outlying units of the Nottingham lace industry, but also by the close proximity of the manifold employment facilities of that large and extraordinarily diversified industrial centre itself.

The other small groups of mining villages and towns are also better situated and in no case present problems comparable with those of the major coalfields either in magnitude or gravity. Nowhere is there any extensive tract where settlement depends solely upon mining, and most of the ill-balanced areas shown on the map represent mining villages that lie close to small or medium-sized towns which possess a much better balance, either because of market and distributing functions for the surrounding areas or because of more diversified industrial bases. Thus the mining villages of East Warwickshire are near Tamworth, Atherstone, Nuneaton, or Coventry; those of South Derbyshire are within a few miles of Burton, and those of the extension of the same coalfield in Leicestershire lie around Ashby-de-la-Zouch; Rugeley is within four miles of the northern collieries of Cannock Chase. The Somerset colliery district is a small area centred upon Radstock, the northernmost collieries being less than six miles from Bristol or Bath, and the southernmost less than five miles from Frome. The whole of the Forest of Dean coalfield is within nine miles of Lydney, and the most important part is less than four miles from Newham-on-Severn, through which pass the main road and railway connecting England with South Wales; while the predominantly mining districts of the North Wales coalfield, which lie mainly south of the Bala-Chester Fault in Denbighshire, are centred upon Wrexham.

It is noteworthy that none of these towns just mentioned, except Radstock, is a purely mining town. Their greater diversity of occupations helps to balance the predominance of mining in their neighbourhood, so that the district balance as a whole is really much sounder than consideration of figures of individual administrative units might seem to suggest. Juveniles from the mining villages and any surplus of workers there have better chances of being absorbed relatively easily into local employment. The towns just mentioned, together with some of those suggested as appropriate key-points for the other coalfields, are among those to which I have elsewhere<sup>1</sup> drawn attention as being especially suitable for development as part of a general policy of decentralisa-

<sup>1</sup> "The Development of Existing Small Towns", see p. 216.

tion of mobile industries. Needless to say any such development would in these particular cases discharge a further useful purpose in enhancing the prospects of alternative employment and improving the services available for the near-by mining communities.

The single-industry towns which are not dependent upon mining present widely-varying states of economic stability and social health, and their planning needs likewise differ greatly according to the nature and prospects of their present industrial basis.

In the first place, there is an important distinction between those whose prosperity rests entirely upon the production of capital goods and others whose mainstay lies in some type of consumption goods. Of the former class are such industries as iron and steel and shipbuilding, of the latter clothing and footwear industries. Stability is given to the economic life of the centres of manufacture of consumption goods by reason of the relative constancy and ubiquity of the demand for their products, always provided that the industry shows adaptability to changing conditions, e.g. of fashion. The weaknesses of such single-industry towns as the footwear centres of Northamptonshire or the knitwear towns of the Leicester region are thus social rather than economic, and socially too they are less serious.

On the other hand the production of capital goods is much more affected by the trade cycle, and is liable to recurrent phases of intense depression, alternating with phases of feverish activity. Such alternations render the economic life of centres entirely dependent on these industries exceedingly precarious. When a period of depression is especially intense and prolonged it inevitably takes its toll among the weaker members of the industry, and is liable to render some towns derelict and to deprive them of all power of resilience when the trough of the depression has passed. Modern Jarrow provides perhaps the most complete and tragic picture of the fate that may befall such towns.<sup>1</sup> Its 36,000 inhabitants were directly and indirectly almost entirely dependent upon one great shipbuilding establishment, for Jarrow is the example *par excellence* of the Company town, and might well have been called Palmerstown. Post-war depression caused the undertaking to decline and finally to close down completely in 1933, when the site was acquired with the express intent of preventing any revival of shipbuilding there and was dismantled. By the middle of 1932 80% of the insured population were without work, and when the last official figures for Jarrow by itself were published in 1935 the proportion was still 73%.

While new centres of this type, such as Scunthorpe and Corby,

<sup>1</sup> Ellen Wilkinson, *The Town that was Murdered*, (1939)

may at present enjoy prosperity, each and all must be regarded as potential Jarrows. Their present prosperity has no sounder basis than the boom conditions that characterised Jarrow during the latter half of last century. The industrial life of such towns must be broadened, if for no other reason than to insure against a catastrophic slump in the basic industry. An example of a welcome step in this direction is the recent successful establishment of a large factory for the manufacture of ready-made clothing at Middlesbrough.

The relative importance of export and home markets is a second important differentiating factor in the prosperity of single-industry towns. Even if the dangers of specialisation in the production of capital goods are avoided, economic stability may be threatened by excessive dependence upon foreign markets, which are subject to the unpredictable and often uncontrollable vicissitudes caused by changes of fiscal policy and foreign relations.

Those industries which during the Free Trade conditions of the nineteenth century built up great export markets, and became dependent upon them for their continued prosperity, have in general been severely hit by modern developments. While the adverse effects have been aggravated by the increasingly prevalent and extreme economic nationalism of recent years, a general contraction of export markets is a natural and inevitable result of the increasing industrial maturity of countries which are industrially younger than Great Britain. Many countries which at first relied upon us for supplies of the products of modern machine industry now have growing industries of their own; and the benefits that have accrued to Britain from her early start in the industrial field are bound to disappear in time. The degree of dependence upon export trade as well as the strength of competition in these markets have of course varied enormously from one industry to another. Thus although the West Riding woollen industry has been adversely affected by contraction of its exports its condition is in no degree comparable with the plight of the Lancashire cotton industry. Nevertheless, the West Riding conurbation, with the notable exception of Leeds which has an unusually wide diversity of industries, is over-specialised upon the woollen industry and its ancillaries. The great majority of its constituent urban districts show proportions of more than a third of their workers engaged in the single industry. Not only is the industrial constitution badly in need of planned measures of improvement, but also as one of the major concentrations of industrial settlement produced by the haphazard expansion of the nineteenth century the area presents an urgent case for physical planning, which may require more than internal readjustments.

The cotton towns of Lancashire are chronic cases, for which

nothing short of drastic surgical treatment can be of avail. The export markets for yarn and piece-goods upon which the cotton industry had come to rely for the disposal of over 70% of its production have undergone a catastrophic reduction since 1920. Nor can the slump in its major aspects be regarded as a passing phase, the trough of a trade cycle; it represents a definitive contraction in possible outlets for the industry to which adjustment must somehow be made.

Reorganisation has been in progress, although it has been slow and inadequate<sup>1</sup>; and reduction in plant and employment have lagged behind the reduction in output.<sup>2</sup> In spite of heavy unemployment the full extent of the labour surplus has been concealed by widespread short-time working and under-employment.<sup>3</sup> The population of the region has scarcely begun to be adjusted to the new conditions, migration having failed so far to make any substantial contribution to draining away the redundant population.

The condition of the weaving districts north of Rossendale is the most serious. A number of reasons account for this. Depression has been more acute in the weaving than in the spinning branch of the industry because of its even greater dependence upon the export market. There are particularly few alternative sources of employment, and such as exist largely depend upon the prosperity of the cotton industry, e.g. the local coal-mining and textile engineering. Finally, the area is more remote from the main lines of transport and is somewhat isolated from major economic foci, so that its natural ability to attract new industries is reduced.

While extension and diversification of the existing industrial basis is certainly necessary and must be sought after, the conclusion cannot be resisted that in such measures alone no full practical solution is to be found. Nothing short of large-scale transference of labour, accompanying diversification, will suffice either to meet the employment problem or to achieve a more balanced industrial structure for the area. Admittedly the carrying out of such a policy is fraught with the special difficulties that arise from the extreme immobility of the local population,<sup>4</sup> but these difficulties underline the ineffectiveness of transference schemes that are not bold and comprehensive. It is transference of social groups not merely of individuals that is required.

<sup>1</sup> Recently the industry has been undergoing a war-time reorganisation involving concentration of production, and the measures taken must have an important and perhaps fundamental bearing upon post-war planning and reorganisation.

<sup>2</sup> W. Smith, "Trends in the Lancashire Cotton Industry", *Geography*, Vol. XXVI (1941).

<sup>3</sup> *Industrial Survey of the Lancashire Area* (Board of Trade, 1932).

<sup>4</sup> *Op. cit.*

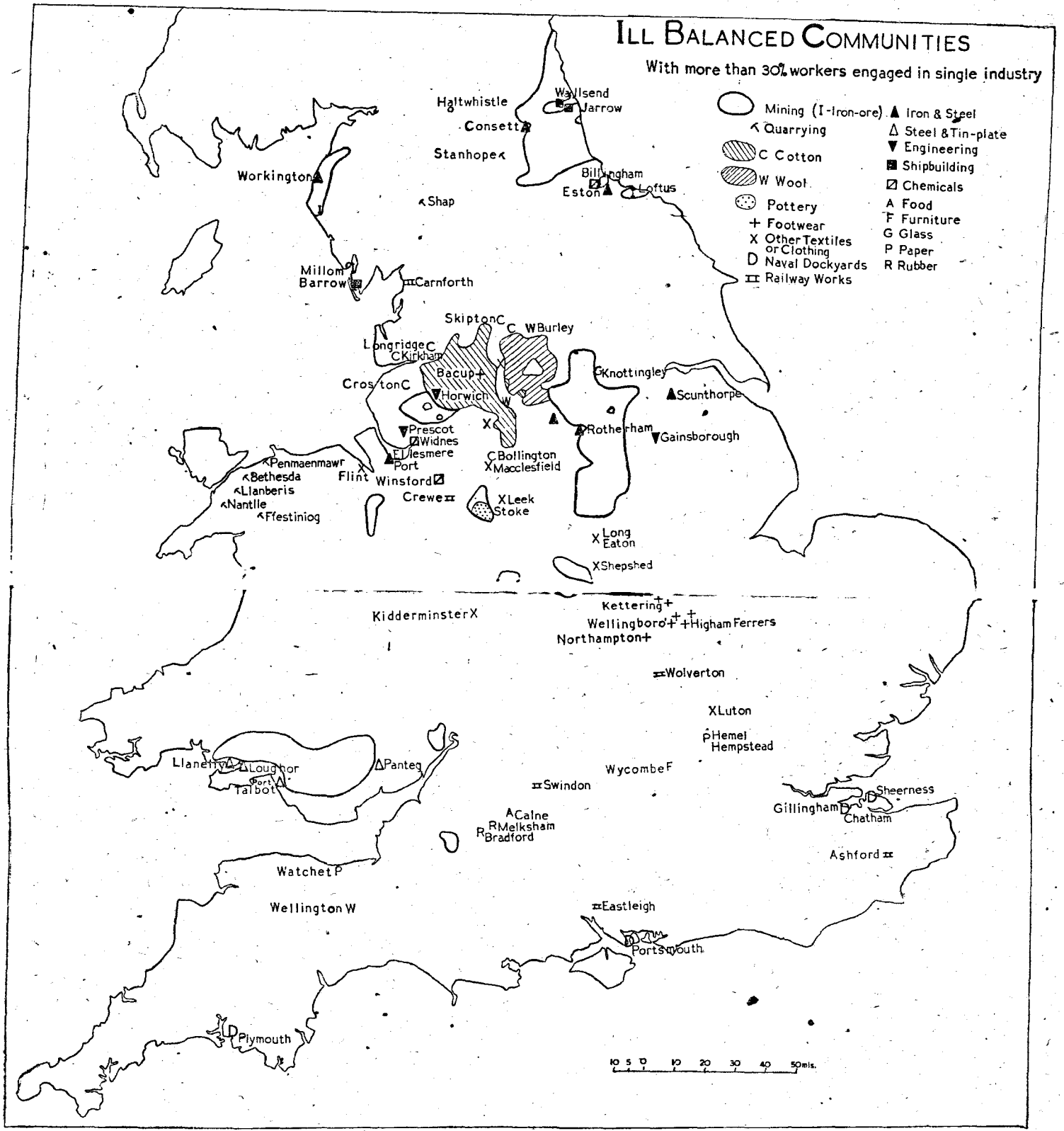


FIG. 1.

[See page 226.]

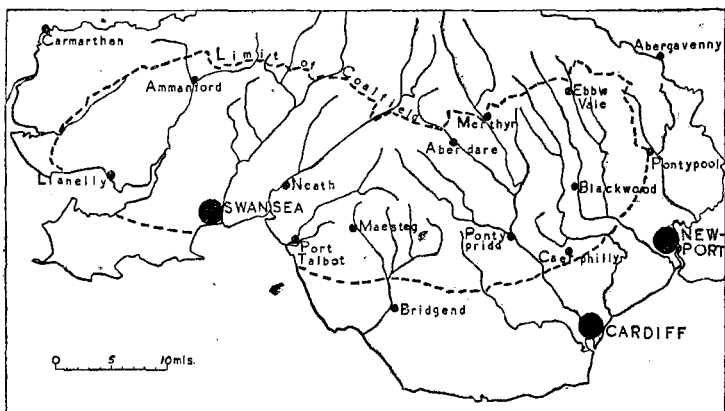


FIG. 2.

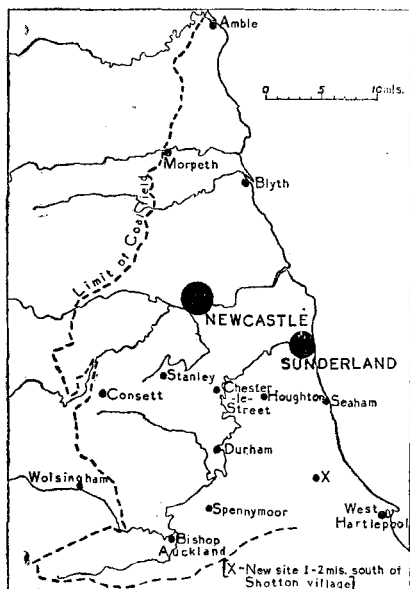


FIG. 3.

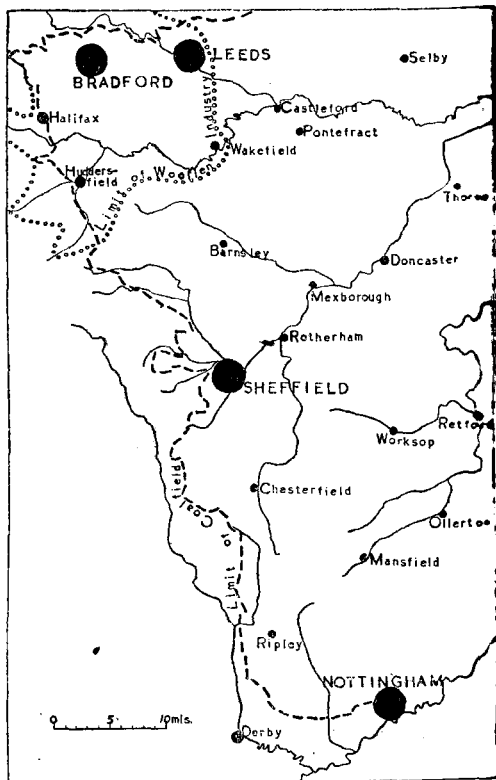


FIG. 4.

Actual or suggested key-centres.

Compared with the half-derelict state of this northern area, the district south of Rossendale is not only less depressed at present, but also has prospects of a greater degree of recovery. While the figures for many of the individual urban areas show little less dependence upon cotton, the regional balance of occupations is much better. Besides a more important coal-mining industry, the region possesses within its borders large engineering industries (including large groups other than textile engineering) and important clothing industries. Even within the cotton industry there is not the same narrow specialisation as in the northern weaving districts. Spinning is the main branch, but weaving is also important, and the finishing processes are much better represented. Not only does the greater range of industrial occupations allow a close dovetailing of the labour force as between male occupations, e.g. coal-mining and engineering, and female occupations, e.g. cotton and dress-making; in the cotton industry itself there is a much better balance between the sexes, because spinning is much less predominantly a female occupation than weaving, while the finishing trades mainly employ males. These inter-relations between the different occupations have established the tradition of dependence upon a pooled family-income, which is a source of great social cohesion and strength. Yet, however great a blessing this feature may be in time of industrial depression, it has its weakness in creating a formidable obstacle to the mobility of labour. The different industries are so bound together in the social structure that a surplus of labour in any of them must be exceedingly difficult to extricate and detach from the interwoven mesh. That there is now a large surplus of labour in the region is a fact that cannot be denied; but the surplus workers continue to be supported in the region not only upon Unemployment Benefits but also in dependence upon earnings from still thriving industries contributed by other members of the family. Either this parasitic state of affairs is to be accepted or else the surplus must be dealt with by providing alternative employment locally or elsewhere. In considering the relative expediency of these solutions the nature of the region must be borne in mind. The cotton region of south-east Lancashire, south of Rossendale, is in reality the conurbation of Greater Manchester,<sup>1</sup> with some longer tentacles and satellites. This conurbation was a product of nineteenth-century industrialisation and is a true product of its age. The values of that age find physical expression in the landscape and environment that have been created here. Two and a half million people live in this small area, the lay-out of which is completely devoid of

<sup>1</sup> C. B. Fawcett, "Distribution of the Urban Population in Great Britain, 1931." *Geogr. Journ.*, Vol. LXXIX (1932).

semblance of planning as befits the home of the economic creed of which the Manchester industrialists were the arch-exponents. *Laissez-faire* is the philosophy of planlessness, the negation of planning. It is true that the physical limit to the district's population-carrying capacity has not been reached. There are still open pores in this vast congeries of man-made structures that have not yet been filled in, spaces where new factories could no doubt be built and yet more people accommodated. But by any standards the optimum size has certainly been exceeded, and space more than anything else is needed if the conditions of housing and amenity-provision that obtain to-day are to be improved. Socially, some measure of dispersal from the agglomeration is badly needed and if independent economic justification for it is necessary it lies in the existence of a permanent surplus of labour over and above the employment capacity of the established industries.

Yet another form of threat to the single-industry town is the possibility which exists in some cases that its products may to a greater or less degree be superseded by new products of advancing technology.

This may be illustrated by reference to the depressed condition of the slate-quarrying communities of North Wales. During this century, and especially latterly, the demand for slates has seriously declined, owing to the increasingly widespread use of tiles for roofing and flooring, the supersession of cheap paper for slates in schools, and the substitution of slate by earthenware products in scullery sinks and other conveniences. The declining industry is carried on in the highlands of North Wales, in relatively inaccessible localities off the main routes, where there is little or no prospect for the rational establishment of any other industry. Provision needs to be made for coping with its continued decline by developing the association of the declining industry with local agriculture by further provision of small-holdings, and by careful direction of juveniles into jobs that are not blind alleys.

One of the most extreme cases of industrial specialisation in the country is to be found in the district appropriately known as the Potteries. This specialisation on pottery-manufacture in the North Staffordshire coalfield has been by default. It reflects the failure of other industries to offer competition for sites and for workers, as they effectively did in other incipient centres of the pottery industry such as Leeds and Tyneside. In the North Staffordshire coalfield no other industry is significant except coal-mining itself, and it in turn is largely dependent upon supplying the basic industry with fuel. If, as does not seem to be out of the question, the use of china should be to a large extent superseded in



the near future by products of the new and rapidly growing plastics industry, we may well ask what will be the repercussions upon this conurbation of 300,000 people? Quite apart from the possibility of a decline in its markets, the district sorely needs the application of planning principles, both in the economic and the physical field.

The categories of single-industry towns that remain to be considered are the few naval dockyard towns, some railway towns, and the chemical towns of the Lower Mersey and Weaver districts and Billingham-on-Tees. Of these perhaps the most hopeful cases for establishing better balance are the railway towns, which for attracting other industries enjoy the great advantages of having excellent transport facilities and a plentiful supply of unoccupied females. Chemical towns present a special problem to the planner, in that their industries are often offensive for residence nearby and are incompatible with certain other industries. Fortunately the chemical centres are few in number, and the newest creation, Billingham, is to be considered less as an isolated example of excessive dependence upon a single industry than as part of the Teesmouth conurbation, for which its appearance has most usefully extended the industrial basis.

Finally there are the dockyard towns, the future of which is bound up with the conditions of international relations and national defence policy in the post-war world. State responsibility for such towns is immediate and direct, and except in the unlikely event of State policy involving a rejection of planning, their problems and needs are not likely to be overlooked in relation to the effects of armament policy.

To sum up, it is evident that in the existence of such over-specialised manufacturing centres and of the lop-sided communities traditionally associated with mining, we are confronted with features in our social and economic organisation which cannot readily be liquidated and with distributional facts imprinted upon the face of Britain which cannot easily be altered. They are an inheritance, however unwelcome, from the passing age of *laissez-faire*, and at the outset will test our capacity to plan a new order.

It is suggested that where, as is so often the case, these communities for one reason or another are tied to the localities which they now occupy, the effective solution to their problems would seem to lie in directing to them an adequate share of those mobile elements of the industrial pattern which have been becoming increasingly numerous. This solution would, in part at least, be common to that of the over-expansion of metropolitan centres to which new factories and dwellings have been accreting during the last few decades at such an alarming rate, and to whose

sprawling extension it is now widely recognised a halt must be called. For while these are in need as it were of some blood-letting the mining and other districts with which we have here been concerned suffer from an anæmia.

## APPENDIX A

THE following is a brief extract from some American publications on the Greenbelt Towns and on other aspects of planning which have a special bearing on the problems dealt with in this book.<sup>1</sup> *E.A.G.*

Briefly, a plan for a community should so arrange its physical elements that the community serves to the best advantage the use intended; this use is its *function*. The component parts of the community should be related to each other and to the whole in a rational and organised manner, this manner constituting its *form*. Any plan in the last analysis rests not only on its own qualities, but literally upon the natural qualities and characteristics of land. To use land intelligently is to recognise *its* form and function as well as the form and function designed to be superimposed upon it. To be successful, the two should be compatible; that is, there should be *fitness* of the whole to its site and surroundings.

(A) Planned towns were largely created for the following reasons :

(1) As seats of government, (2) as military outposts for colonising newly acquired frontiers, (3) as centres of protection from invasion, (4) for religious and political purposes, (5) as ports on deep water or head of navigation, (6) at crossings of caravan routes, (7) at water-power sites, (8) at bridges and straits, (9) in a cool climate, and (10) in America, by land development companies for profit. Each reflects in its dominant motif that function and culture of its particular period: walls, agora, cathedral, theatre, fora, castle, palace.

(B) There was no continuing policy of planning throughout any long period. The consideration of the plan as a finished product failed to recognise the town as dynamic. Thus, no provision was made for the disposition of future growth at the periphery.

The advent of the industrial era and modern life with the resulting congestion of urban centres has brought about a new objective which the planned town has been asked to fulfil and consequently a new conception of its significance. There have been during this period the same attempts to depict the ideal, and concrete attempts at these ideals became known as model towns. In defining a model town, Grosvenor Atterbury has set forth the following principles, which apply as well to the somewhat broader conception of the planned community as considered in this study. While the particular interest of this study is in evaluating planned towns which have functioned over a period of years, his statement indicates what should be found in any of them before they can be considered as completely meeting the situation.

1. The most distinctive feature is the essential element of col-

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<sup>1</sup> The quotations are mainly from the Report on "Urban Planning and Land Policies", National Resources Committee, 1939.

lectivism upon which the planned town should be based—collective design, development, and control.

2. The aim should be towards higher standards and more efficient handling of land development and distribution.

3. The science and art of town planning and good housing should be applied.

4. The model town should demonstrate to the individual the advantages of a reasonable self-restraint, of the subordination of his own æsthetic impulses to a general æsthetic scheme.

5. It should cause actual money-saving in lay-out and at the same time provide better conditions than could exist under "individual methods".

6. No experiment or demonstrations should be made that could only be duplicated with the aid of philanthropy, charity, or paternalism, or in which collective action might not be equally possible or safe. It must be organised and developed on a business basis and must succeed as such.

#### Kapuskasing, Ontario, Canada.

This town was incorporated by Chapter 36 of the Statutes of Ontario, 1921. This act authorised the Government of Ontario to enter into an agreement with the Spruce Falls Co., Ltd., for the planning, laying out, and establishment of a town site. . . . The principal reasons for the Government's action in this matter were to prevent the town becoming a "closed" or "company" town, the consideration that they could not always depend upon the lumber industry, and the policy of the Dominion Government to encourage the development of agriculture as well as lumbering, thus promoting the balanced development of the entire section.

#### Greenbelt, Prince George's County, Md. .

The present plan, which provides for 1,050 dwelling units, is essentially a series of super-blocks, each of about 15 acres, which surround a central area devoted to business, school, and community centre. Pedestrian underpasses which lead to the central area have been provided in each block under the main thoroughfare. Two concentric main thoroughfares with cross streets at intervals provide access to the blocks and group garages. The area devoted to housing and intensive urban development comprises about 225 acres, with the remaining area forming a permanent greenbelt about the town site to be utilised as allotment gardens, small farms, recreational and woodland areas. . . . The community is designed to serve an average income group of \$1,500 per year, with an estimated range of \$1,200 to \$2,400. . . . The community has not been planned as a self-contained town with regard to employment, although about 200 acres, part of which lie within the 2,000 acres of the town site, are available for industry. It is primarily intended for Government employees working in the research centre and in the north-east section of the District. It is anticipated that the research centre will provide employment for about 5% of the expected population.

However, it was planned that all of the community's needs should be met, so far as possible, through co-operative trading. . . . Each group of houses is provided with one furnace which heats all of the units in that group, thus requiring only one basement room. . . . In addition to the common park areas within each superblock, the central area provides a school and community centre, and a business group of 15 store units to be operated by the community organisation for its own benefit. An athletic field is located adjacent to the school. Water areas and other recreational areas have been allocated in the greenbelt, which will be available to the residents of the county as well as to the community.

The Resettlement Administration describes the basic programme of the Greenbelt Towns as follows: "To obtain a large tract of land, and thus avoid the complications ordinarily due to diverse ownerships; in this tract to create a community, protected by an encircling greenbelt; the community to be designed primarily for families of modest income, and arranged and managed so as to encourage a family and community life which will be better than they now enjoy, but which will not involve subjecting them to coercion or theoretical and untested discipline; the dwellings and the land upon which they are located to be held in one ownership, preferably a local public agency to which the Federal Government will transfer title, and which agency will rent or lease the dwellings but will not sell them; a municipal government to be set up, in character with such governments now existing or possible in that region; co-ordination to be established, in relation to the local and State governments, so that there may be provided those public services of educational and other character which the community will require; and, finally, to accomplish these purposes in such a way that the community may be a taxpaying participant in the region, that extravagant outlays from the individual family income will not be a necessity, and that the rents will be suitable to families of modest income. To develop a land-use plan for the entire tract; to devise a system of rural economy co-ordinated with the land-use plan for the rural portions of the tract surrounding the suburban community; and to integrate both the physical plans and the economies of the rural area and the suburban community."

The site of each Greenbelt Community was studied carefully and every acre was assigned its logical function in an expertly designed community plan. A town common forms the centre of each community. Around it are grouped a community building designed to serve both as a school and a town meeting hall, stores, post office, bus terminal, and other offices.

The residential area surrounding the town common is laid out with a comparatively few streets. Usually the blocks are five or six times the size of the average city square, and each of them resembles a small park with about 120 dwellings around its edges. This arrangement has many advantages. Houses face the lawn and

trees on the interior of the block, rather than barren pavement. Although each house has its own yard, much of the block's interior serves as a playground for the entire neighbourhood. A network of paths running through this park eliminates the need for sidewalks along the streets. Paving, water-works, and sewer lines can be installed at a considerable saving under such a super-block system. The most distinctive feature of the three communities is the greenbelt from which they take their name. This is a broad girdle of open land intended to protect the community from overcrowding and undesirable building on nearby property. Part of the surrounding greenbelt is reserved for parks, forests, and playgrounds. Garden tracts also are set aside for families who wish to supplement their incomes by raising their own fruit and vegetables. The remainder is cultivated by full-time farmers, who may market their produce in the community stores.

The town plan has been especially designed to meet the problems created by modern motor traffic. Facing houses away from the street, with playgrounds and paths removed from street's edge, reduces traffic dangers. All homes, moreover, are removed a considerable distance from arterial highways. Underpasses for pedestrians have been built at points where footpaths cross busy streets. Ample allowance has been made for future expansion. All three communities are designed to accommodate an expected growth to three or four times their present size. Greenbelt now has 885 homes, but its sewer mains, water-works, roads, and utilities can serve an ultimate population of 3,000 families. Greenhills, with 676 homes and Greendale, with 572 homes, are built to take care of similar expansion. Negotiations with private capital for construction of additional homes at Greenbelt under a limited dividends arrangement are already in progress.

Homes are built in a variety of types and sizes to fit varying family needs. In Greenbelt 574 homes are group or row houses, which are less expensive than detached types; 306 are apartments and 5 are detached houses, built as an experiment in prefabrication. All are simple in design, but efficient and modern. All meet strict standards of comfort, ventilation, sanitation and privacy, and all are built to stand for 75 years or more with lowest possible maintenance costs.

Greenbelt is situated in Maryland about 13 miles from the centre of Washington. The total demonstration comprises 12,259 acres (cost about £18 10s. per acre), of which 8,659 acres are under the jurisdiction of the Department of Agriculture and are occupied by a research station experimenting in agriculture, forestry and soil conservation. To the Greenbelt Town 3,600 acres were allotted. Of these 967 were set aside for the social and economic needs of the community as follows :

- 217 acres of good buildable land for dwelling units and community facilities ;
- 500 acres adjacent to community reserved for future expansion ;
- 250 acres lying in a valley-like area enclosed in the town's crescent shape for recreation.

The remaining 2,633 acres are to be used as follows :

- 157 acres devoted to small farm units,
- 276 acres assigned as pasturage for town dairy,
- 400 acres set aside for woodland and forest,
- 80 acres of wasted land to be reforested,
- 107 acres for allotment gardens,
- 1,593 acres to form the outer greenbelt and for recreational use.
- 20 acres for community school purposes.

Radburn, Bergen County, N.J.

Established in 1929 by the City Housing Corporation within the corporate limits of Fairlawn Borough. Population, 1936, approximately 1,450. Site and housing planned by Henry Wright and Clarence Stein, planners and architects.

About 2 square miles of land lying north of the centre of Fairlawn was purchased, and an industrial district of 127 acres was set aside. Essentially, the objective of the founders was to provide a community, based upon garden-city principles, which would provide (1) a maximum of convenience for the movement of motor traffic ; (2) a minimum of conflict between motor and pedestrian movement ; and (3) all possible improvement over current custom in the consideration of the health and happiness of residents. The adaptation of the cul-de-sac, the use of the superblock, a system of interior park areas, the designation of independent park and motor entrances to each house, and the separation of pedestrian and motor traffic, are the outstanding features of the plan. Superblock sizes vary between 35 and 40 acres in area, each surrounded by wide traffic streets, giving access to a series of narrow cul-de-sac streets averaging about 275 feet in length, around each of which are from 10 to 18 dwelling units. Linear park areas of from 3 to 7 acres were formed in the interiors of the superblocks. These areas, connected with each other by grade separations at the traffic street rights-of-way, form not only the park system of the town but the facilities for pedestrian circulation as well. However, the scheme was intended as an attempt not only to reduce the friction between wheeled and foot traffic, but also to reduce excess costs in street and underground utilities. The resultant saving expected is set forth by Henry Wright in a statement in *The American City* of December, 1928 : ". . . in order to appreciate the economies of the plan, it is necessary to examine an individual lane. This lane contains 16 house lots averaging 43 feet wide, or 680 feet of frontage. The lots are served by  $\frac{1}{2}$  of 230 linear feet of utilities on the main street and 300 lineal feet from the centre of this street to the end of the lane, a total of 415 lineal feet of utilities or 26 feet per lot. However, let us suppose the street end of the lane containing the first 10 lots to be doubled on axis A, forming a normal block 400 feet long containing 20 lots, averaging 45 feet. This would require twice  $\frac{1}{2}$  of 230 lineal feet of utilities on the two end streets, and 480 feet of utilities from centre to centre of the main streets, a total of 710 lineal feet for 20 lots or 35.5 lineal feet of utilities per lot,

an increase of 36% in utilities required in the Radburn plan. In other words, in a normal street plan a lot 43 feet wide will require 21½ feet of utilities (43 feet shared with opposite lot) on its front line and 13½ feet (60% extra utilities on side frontage) making a total of 35 feet. At Radburn a 43-foot lot requires a total of 26 feet of utilities, an excess of only 4½ feet, or less than 20% for side-street waste and intersections. Admitting the obvious problems brought up by this or any other new method of planning, it would seem worth an experiment to save from 25% to 30% of the utilities now required in residential neighbourhoods.

The most striking feature of Radburn is the interior system of parks and the grouping of the houses. In spite of the elimination of the "rear" entrance, the cul-de-sac still has the appearance of a rear approach and the suggestion of an alley. This is largely due to the presence of pole lines, the inevitable use of the abutting yard for service purposes, and the concrete centre-drainage pavement. All of these items are looked at askance because they are commonly associated with alleys rather than because they are organic defects. This brings up the question of the practical limitations in the abolition of the "rear" yard, and the importance to be attached to the street picture. If, however, the streets are considered as purely functional and utilitarian boundaries for the interior parks and the social unity which the latter suggest, another consideration arises in that less than 20% of the houses actually face on park areas.

*Community Facilities.*—The social success that has been realised at Radburn rests largely upon the following considerations: (1) The physical plan has provided facilities in a pattern which has turned the focus inward on to the parks, school, swimming pool, etc., and relegated to the periphery the conflicting influences of traffic and business. By this arrangement, the mechanics of encouraging a unified social life have been facilitated. (2) A social programme was provided with great thoroughness. (3) The age composition of the population is below the general average, being around 35 years. A large percentage are college graduates, and the earning capacity of the families is on a comparable level. These elements offer another factor for congenial social activity. In addition, between 25 and 30% of the population are children, a large percentage of whom are under school age. (4) The lack of community life in metropolitan New York has drawn together a group of more or less socially unattached persons, each seeking a common element. . . . It has been observed at Radburn that in those instances where incomes varied widely, difficulties were encountered in regard to the provision and maintenance of recreational facilities by an association dependent for its support on fees or assessments. The discord comes, of course, in the inability of the poorer members to pay the current fee while at the same time requiring, at least, the same facilities.

The "company town" is financially an adjunct of the factory, and short-sighted desires of the factory may readily harm the town.



In the relatively few cases among the towns selected for study where such short-sightedness has prevailed, one or more of the following objectionable features have been noted. They arise largely from the consolidation in a single agency of the functions of landlord, employer, and town manager. These are not all mutually exclusive, but react in many ways on one another.

- (1) Poor quality of housing due to cheap construction.
- (2) Poorly planned and inadequate provision for recreation.
- (3) Too small an area and population for an adequate social life.
- (4) Insufficient attention to management.
- (5) A policy of housing the greatest possible number of workers in each dwelling, with bad social results.
- (6) The use of low rents, based on insufficient accommodations, as a lever for low wages, so making a circle of sub-standard living.
- (7) Tendency to give overtime work and such special opportunities exclusively to tenants of company houses.
- (8) Similarly, tenancy of company houses depending on "satisfactory" behaviour in the factory.
- (9) Company control through subsidy of schools and churches.
- (10) Company control of stores, tending to monopoly and too high prices.

The following reasons for the selection of any particular site by industries were given in response to questionnaire and interview as the primary factor or factors governing this selection. Since several reasons were sometimes given for one community, the totals of the percentages of course exceed 100%.

GENERAL CONSIDERATIONS AFFECTING LOCATION OF INDUSTRIAL TOWNS

	%
Existing industry . . . . .	32
Presence of other cities or a metropolitan region . . . . .	27
Needs of the proposed industry . . . . .	23
Climatic considerations . . . . .	20
Broad topographical considerations . . . . .	20

SPECIFIC CONSIDERATIONS

	%
Rail transportation . . . . .	39
Access to raw materials . . . . .	36
Available water or hydroelectric power . . . . .	27
Adequate labour supply available . . . . .	18
Available industrial clear water . . . . .	16
Nearness of a market or markets . . . . .	13
Lower land costs . . . . .	13
Utilisation of by-products . . . . .	9
Facility of processing . . . . .	9
Water transportation . . . . .	9
Decentralisation or freedom from congestion . . . . .	9
Lower operating costs . . . . .	7
Land previously owned by the industry . . . . .	4

The communities planned and developed by governmental agencies fall in general into three classes : (1) power and reclamation development ; (2) war emergency ; and (3) redistribution of population. As in industry the community locations were largely determined by the activity for which they were established. The permanent war housing developments had two considerations in mind after a shortage of housing in any one vicinity had been determined : first, to provide homes for war workers in shipyards and munition plants on adequate sites, favourably located with reference to the industries they were to serve, with regard for local conditions, limitations, and war-time emergency ; second, to take into consideration the adaptability of the development after the war to permanent community use in company or in individual ownership.

#### DISPOSITION OF THE BUSINESS DISTRICT.

The disposition of stores at the entrance of the principal street at Hilton and in the interior of the development at Cradock is worthy of comparison. Both developments are similarly disposed in relation to main highways and entrance street. The arrangement at Hilton seems preferable for several reasons. First, business is removed from the interior to the main highway, to the mutual advantage of both business and residential areas. Second, less frontage of residence on the highway and more in the interior of the development results, and third, more persons living within the development pass through the business area to and from their work.

#### DISPOSITION OF OPEN SPACES.

In the relationship of recreational areas to residential districts, Alcoa is unique in its linear park arrangement enclosing what are essentially small residential neighbourhoods. The central park at Fairfield, Ala., is effectively used by the residential areas on all sides for passive as well as active recreation. It has a tendency to exert a social pull which has aided in creating a worth-while community spirit. Radburn's linear park system forms essentially the base upon which the residential groups are superimposed.

*Summary.*—There is an interesting relationship to be observed in the disposition of industrial, business, and recreational areas in relation to the residential areas they serve.

1. Industry may take in varying degrees one of three forms in relation to residential area :

- (a) The central industrial area.
- (b) The circumferential industrial area.
- (c) The detached industrial area.

2. Business may take in varying degrees one of five forms :

- (a) The central business area.
- (b) The lineal business area.
- (c) The business area on the periphery, usually at the main entrance.
- (d) The central business area touching several surrounding residential units.

- (e) The scattered localised business area.
3. Park and recreational areas may be disposed in :
- (a) Central compact areas.
  - (b) Lineal marginal areas.
  - (c) Scattered local areas.
  - (d) Lineal interior systems.

An important recent development in street-pattern design has been the use of the so-called superblock. In this scheme, the secondary streets providing circulation within the community are so spaced as to produce very large blocks. As applied at Radburn, short culs-de-sac give local vehicular access to the dwellings within the blocks. The secondary streets or "motor roads" may follow a gridiron, curvilinear, or radial pattern. At Radburn, several additional features of the superblock system, though not essential to its basic idea, are designed to increase its advantages as to safety, privacy, and general avoidance of the nuisance ordinarily accompanying automobile traffic. There, dwellings do not front on the motor roads, but a system of interior parks and walks provides a park and pedestrian entrance on the opposite side of each dwelling from the paved cul-de-sac lane which provides motor access. A modification of the superblock idea used at Greenbelt practically eliminates the culs-de-sac, which are replaced by garage compounds.

The main factors which preserve the character and individuality of planned communities are :

1. The existence of natural or artificial peripheral buffers.
2. The provision for new peripheral barriers as part of the plan either primarily or incidentally as protection.
3. The control of land beyond the periphery.
4. The articulation and stability of the physical plan.

The minimum population required to support any facility will vary inversely with the income of the population :

1. That a community of 1,000 to 1,500 population is the minimum limit for the provision of one church, which would represent physically the importance of religion in this community, and that only where a fairly homogeneous group exists.
2. That 2,000 to 2,500 population is the minimum limit at which a good grade school may be supported either financially or in relation to the number of children in attendance.
3. That 15,000 to 20,000 population is the minimum limit at which adequate hospital facilities may be provided in any form except a clinic.
4. That community facilities in the form of parks, playgrounds, or other open spaces are usually more easily possible for the small separate community than for the larger town.
5. That a community spirit is not dependent upon size but rather upon factors, physical and social, which stress common opportunity and common responsibility.

6. That these factors are of major importance in determining the location of a community.

#### CENTRALISATION AND DECENTRALISATION OF COMMUNITY FACILITIES.

The important consideration here is to determine which of all the public functions shall be centrally located and which shall be, under the particular circumstances, peripheral or scattered. There are some valid reasons for believing that the placing of business at the centre is not necessarily a desirable location, particularly in the type of communities herein studied.

1. A pressure is created at a point, resulting in intensive use, the introduction of through traffic into the centre and, with the growth of the community, a continued increase in congestion.

2. Such centralisation tends to produce radial thoroughfares, and so to break the community into segments, often too small to have an identity of their own. This frequently creates the necessity of locating community facilities such as schools and playgrounds where they are separated from some of their users by main thoroughfares.

3. If "community" is to be taken in its true sense as a society of persons, it follows that the expression of this concept should be translated into a physical form which will encourage its best realisation. Business alone, as a focal centre, expresses only one side of economic unity.

On the other hand, the following reasons may be suggested for providing a community centre in its literal sense and grouping business at a point on the periphery.

1. The attraction which business exercises is directed outward not inward.

2. Through traffic may then be relegated to the periphery, to the advantage of both the business and the community, leaving the central area accessible without separation by through traffic streets and unified for its proper use for other community activities and for residence.

It is not intended to suggest by this discussion that a central business area is not possible or even desirable, but rather to suggest the possibility of replacing indefinite expansion with "unit" development. Some proportion of business is almost most conveniently central. When a small town can support but one or two stores of a kind, naturally these seek the centre. When a town grows, the stores, of which there are by that time many, may seek scattered location in local sub-centres; but wholesaling, banking, and such activities usually remain centralised.

Town government, as expressed in the "town hall", is usually centralised and remains so in the city of considerable size.

For economic reasons and for convenience, religious activity, in our country of many creeds, is likely to produce scattered churches.

Recreation facilities, since accessibility and not too high intensity of use are desirable, tend to be scattered in relation to tributary districts in the same way as schools, with which they should have close interrelation. The larger recreational units tend to be on the

periphery for obvious reasons of land cost and avoidance of interruption to radial traffic.

The arrangement which might be considered "natural", therefore, would be a centralisation of the provisions for governmental structures, and of such business as is used by all the community or necessarily juxtaposed, together with various other generally used structures according to circumstances and some communally used open space, and the peripheral location of most other services.

The self-sufficiency of trading in a community founded either for industry or for residence has a direct bearing on the provisions of the physical plan. . . . No fixed rule of thumb will apply to every individual case, but a thorough study should be made of the proximity, character, and adequacy of nearby existing business provisions and the type and income of the expected population, and the estimates so evolved checked against available knowledge, of general norms, before the extent of any business area is determined. Too little area may mean monopoly by the shops fortunate enough to locate there, while too much area will react unfavourably in the form of scattered business and costly maintenance of excess public utilities by the community. An immediate over-provision of business frontage can hardly be justified except on the basis of well-founded expectation of reasonably early future growth, and such provision is certainly not justified merely for speculation purposes.

If the area of the tributary region and the optimum population density for that area can be determined, it is possible to fit the business area economically to the need and avoid both too small an area and too large an area. If, however, the ultimate tributary area is unknown, there is no way of avoiding the difficulties mentioned above if the area is to be served by a single business district. The effective way, therefore, to provide for definite expansion (or, for that matter, gradual expansion to a definite limit over a long but indefinite period) is to plan for expansion by units, each unit providing its own facilities of all kinds, excepting only those few which must be single and central in any case, these being found in the last analysis to require only a relatively small percentage of the total area. In this manner, the growth as it comes can carry with it its own facilities. Thus, growth and change are to be accomplished not by the undifferentiated extension of the lot system and adaptation of individual lots to changing uses, but by organised provision of community or neighbourhood units.

#### SELF-SUFFICIENCY OF COMMUNITY LIFE.

(1) As reported in the study made of Radburn in 1934 for the American Association for Adult Education and published as *Radburn: A Plan of Living*, about 81% of the men and women were found to participate in three or more community activities. Participation in recreational activities, based on 320 men and 366 women, was as follows:

C.S.N.F.

M\*

	Percentage of men.	Percentage of women.
Participation in at least one recreational activity . . . . .	90.3	77.87
Participation in at least two recreational activities . . . . .	72.5	56.3
Participation in at least three recreational activities . . . . .	57.18	34.6
Participation in at least four recreational activities . . . . .	38.75	13.39

(2) Evidence of the comparatively limited extent to which the theatre and moving pictures are attended elsewhere by residents of Radburn, where no such facilities exist, appears in the following quotation from this study :

“ Seventy-five per cent of the Radburn families attend the theatre (as distinguished from the moving pictures) three times or more a year. One-third of these attend as often as six times a year, and one-sixth as often as once a month. Nearly 95% of the theatre-goers go to the theatres in New York City ; 87% of Radburn families go to the moving pictures six times a year or more. Four-fifths of these go at least once a month, half go once every two weeks, and one-third go at least once a week.”

It is worth noting, in connection with community self-sufficiency, that an evident indication of community consciousness, individual to each community, was expressed by the consciousness of the workers (many of whom were talked to casually during the field study) that they were living in a community which was different from the ordinary type of development, that in many ways they were provided with facilities which were better, and that, without analysing it further, they were part of a distinct and well-related unit that had been laid out all as one entity. . . . The physical plan has almost invariably been a major factor in cementing the individual interests of the planned community into one substantial form of better living and self-sufficiency, and that, in turn, this attitude has helped the maintenance of the plan. This belief is borne out by the number of industries which consider that providing this type of community life in its best physical form is purely a matter of good business.

The following definition of the *slum* is based on a general theory of city growth and of the spatial distribution of social functions in the city. It is best summarised by E. W. Burgess : Studies of urban growth reveal that the city grows outward from the central business district in a series of expanding zones. There is a “ zone of transition ” encircling the downtown area. This is the area of deterioration, the so-called slum, created in large part by the invasion of business and light manufacture. A third area is inhabited by workers in industry who have escaped from the area of deterioration

and who desire to live within easy access of their work. Beyond this zone is the residential area of high-class apartment buildings or of exclusive restricted districts of single-family dwellings. Still farther out beyond the city limits is the commuters' zone or suburban areas or satellite cities within a 60-minute ride of the central business district.<sup>1</sup>

While various topographical factors may distort this pattern, the principles which underlie it continue to operate even though certain additional factors enter into the situation. Taking this approach as a basis, the slum has been further described as follows :

The slum is a distinctive area of disintegration and disorganisation. It is an area in which encroaching business lends a speculative value to the land. But the rents are low ; for while little business has actually come into the area it is no longer desirable for residential purposes. It is an area of dilapidated dwellings, many of which the owners, waiting to sell the land for commercial purposes, allow to deteriorate, asking just enough in rent to carry the taxes. Except for the sporadic building of factories and business blocks, no building goes on in the slum, and most of its structures have stood for a generation or more.

Aside from a few marooned families, a large part of the native population is transient ; prostitutes, criminals, outlaws, hobos, foreigners who came to make a fortune as we used to go West, and expect to return to the old country as soon as they make their " stake ", who are not really a part of American life and who wish to live in the city as cheaply as possible, live in the lodging-houses of the slum. Here, too, are the areas of immigrant first settlement.

The slum gradually acquires a character distinctly different from that of other areas of the city through a cumulative process of natural selection that is continually going on as the more ambitious and energetic keep moving out and the unadjusted, the dregs and the outlaws accumulate. This is particularly noticeable in the more static European cities. In America where competition is uncontrolled this selective process lends the slum a submerged aspect. The city, as it grows, creates about its central business district a belt of bleak, barren, soot-begrimed, physically deteriorated neighbourhoods. And in these neighbourhoods, the undesirable and those of low economic status are segregated by the unremitting competition of the economic process in which land values and rentals and wages are fixed.<sup>2</sup>

Harmonious *neighbourhood development*, as an important factor in stable investment, has been officially recognised by the Federal Housing Administration under title II of the National Housing Act. Applicants for mortgage insurance are informed that neighbourhoods which are attractively planned, harmoniously developed, and protected by well-drawn and strictly enforced zoning regulations and proper deed restrictions will receive the most favourable con-

<sup>1</sup> E. W. Burgess, " Can Neighbourhood Work have a Scientific Basis ? " in R. E. Park, E. W. Burgess, and R. D. McKenzie, *The City* (Chicago, 1925).

<sup>2</sup> Harvey W. Zorbaugh, *The Gold Coast and the Slum : A Sociological Study of Chicago's Near North Side* (Chicago, 1929).

## AVERAGE SPACE REQUIREMENTS OF AMERICAN CITIES

Use.	Net acres per 100 persons.	Percentage of developed area.
Residence . . . . .	3.0	40
Commercial . . . . .	0.2	3
Industrial . . . . .	0.5	7
Railroad property . . . . .	0.4	4
Streets . . . . .	2.7	30
Parks and playgrounds . . . . .	0.6	6
Other public uses . . . . .	0.5	6
Semi-public uses . . . . .	0.3	4
<b>Total . . . . .</b>	<b>8.2</b>	<b>100</b>

sideration. Assuming that the qualities which produce a satisfactory social condition also tend to assure economic soundness, the Federal Housing Administration has focused the attention of lenders and builders on avoidance of environmental conditions that exercise, in considerable degree, those disintegrating influences which are as certain to destroy property values as defects in the buildings themselves.

The growth of the city created the need for replacing the lost social unity of the small village. A significant attempt was made in 1907 in Rochester, N.Y., in the movement under the leadership of Edward J. Ward, to establish the school as a neighbourhood centre. Mr. Ward characterised the idea as "the restoration to its true place in social life of that most American of all institutions, the public school centre, in order that through this extended use of the school building might be developed, in the midst of our own complex life, the community interest, the neighbourly spirit, the democracy that we knew before we came to the city".

The neighbourhood unit has been described as a satellite form of development either within or outside the town itself.

The advantages claimed for planned neighbourhood units are:

1. Safety from automobile traffic and relief from waste due to traffic congestion.
2. Civic benefits resulting from natural growth of social movements through ease of communication among residents.
3. Municipal economies through savings in street area and preservation of the best and most stable use of publicly provided schools, playgrounds, utilities, etc.
4. Stability of property values due to greater control over disintegration and encouragement of beneficial elements.
5. Provision of recreation space at minimum cost to city or developer through saving in street area.

Application of the neighbourhood unit idea to subdivision planning is mainly a matter of education. When developers have learned of the advantages of this system through examples of successfully



planned neighbourhoods, they will soon begin to apply its valuable principles to their plans. The accent placed upon investment rather than speculative returns from housing developments will undoubtedly result in increased consideration of long-term values. This means economy through large-scale planning, protection of neighbourhood services, and protection from inharmonious influences through rigid restrictions, all serving to create a stable neighbourhood population and continuing economic advantage.

Unless our State and municipal governments have the foresight and the courage to adopt *rational urban land policies*, the alternative might conceivably be a growing demand for the *complete* restoration to the people, as a present rather than an ultimate reality, of the land-ownership which, in the Constitutions of the States of Wisconsin and South Carolina, for example, is guaranteed to them in the clause which declares that :

The people of this State, in their right of sovereignty, are deemed to possess the original and ultimate property in and to all lands within the jurisdiction of the State.

Those who advocate that American municipalities gradually acquire by constitutional means their entire underlying land offer in support of their recommendations such facts or assumptions as the following :

1. The land and the sea and the sky were created or evolved before man. When man finally came, he found them awaiting his use. He had no part in their creation, yet they are necessary to his existence. Without land, a man has no place to set his foot. Thus we see the danger inherent in the private ownership of land. Those in whom land-titles are vested can exclude their fellow humans from the earth if they so desire ; the others cannot even *build* a place to stand on. Therefore, there can be no inherent right to exclusive ownership ; the land is the natural heritage of society, and every human being has a right to live upon it.

2. For a great many years valuable land has been largely monopolised. Ever since the disappearance of the frontier we have watched the growth of a propertyless class living at the mercy of landowners. Wealth increases with scientific advance, but the holders of title to the surface of the earth are able, without rendering commensurate service, to deprive the great masses of mankind of their proportionate share of the fruits of their productivity. This is not pure theory. If one follows the history of wages in all countries, he will see that average wages, in proportion to the total national income, start downward simultaneously with the disappearance of the frontier. As soon as access to the land is denied, there is no choice for most men but to sell their labour to others for what they can get.

3. It is the duty of the State to protect the freedom and security of its citizens, and political freedom is empty without economic freedom. Private ownership of land has ceased to fulfil the purpose it once had of providing maximum economic security for all. Now the minority only is secure.

4. Urban ground rents, if not collected by the community that

creates them, are certain to be collected by landowners who do not create them.

5. Forward-looking municipalities the world over are recognising the need for increased land in public ownership, for recreation, low-rent housing, school sites, and other purposes, and are making plans for adding to their landholdings within, and sometimes beyond, their corporate limits.

6. Public administration of land would involve no insuperable difficulties. It is primarily a legal and fiscal problem. Public interest would be paramount, and contrary to the contentions of some, a great amount of corruption would be eliminated from government. Instead of speculative landowners absorbing much of the benefit of population growth and public expenditures, the returns on public improvements could be used to pay their cost or be put into more public improvements, with only the best interest of the community in mind.

7. If any city had owned, and retained from its inception, title to its entire site, that city would have been planned more scientifically, developed more rationally, and be less burdened with taxes than the ordinary city of to-day.

8. Ownership of both site and building is not essential to the development of land for business or residential purposes. Witness the extensive use of the leasehold system in many cities, the rents accruing, however, to private owners rather than to the communities that have created them.

9. Our present system of land tenure encourages the use in many cases of the less desirable land in a city, or of land outside the city's limits, while much desirable land within the city is held vacant or poorly improved for possible speculative gain.

10. Assuming the public interest to demand the retention, under proper controls, of our capitalistic system, there must be recognition of the fact that land-gambling is a parasitic trade, and rejection of the too common assumption that mere land speculators and jerry-builders should be permitted to rank with high-grade realtors, manufacturers, merchants, and bankers, as members of the local business community.

If *zoning* is to effect industrial decentralisation in large cities and metropolitan areas, special care must be taken in restricting the size of industrial zones. Industrial zones should, of course, be made sufficiently large in the aggregate to care for every reasonable demand for future expansion and growth, but too large industrial zones may very readily become the means of a considerable amount of congestion to both population and industry. Many cities would do well to review the size and arrangement of their industrial zones in light of their probable effect upon the prospective population pattern of the community.

## APPENDIX B

### COMPONENTS OF TYPICAL TOWNS WHICH ARE FAIRLY ISOLATED AND NOT PART OF A GREAT URBAN AGGLOMERATION

#### I. A TYPICAL TOWN OF ABOUT 20,000 INHABITANTS

1.	Population . . . . .		19,535 (in 1931)
2.	Sex and age composition of population	Males	9,461
		Females	10,074
		Male.	Female.
	Age 0-14 . . . . .	2,296	2,299
	Age 15-19 . . . . .	815	854
	Over 20 . . . . .	6,350	6,921
3.	Number of families . . . . .		5,152 (Private)
4.	Total number of population employed in industry . . . . .	—	
5.	Total number of population employed in local services (Municipal, trans- port, commercial, etc.) . . . . .	—	
6.	Existing industries, the nature of each and the number of employees in each (distinguishing between male and female) . . . . .	—	
7.	Local services, the nature of each and the number of employees in each (distinguishing between male and female) . . . . .	—	
8.	Number of houses . . . . .		5,648
9.	Number of flats . . . . .		60
10.	Number of churches . . . . .	Church of England	3
		Roman Catholic	1
		Nonconformist	7
		Total	11
11.	Number of schools . . . . .	(a) Elementary	12
		(b) Secondary 2 and 1 Technical College	
12.	Number of public libraries . . . . .		1
13.	Number of public swimming baths . . . . .		1
14.	Seating accommodation of cinemas . . . . .		3,449 in three cinemas
15.	Area of public open space . . . . .		62.5 acres
16.	Number of allotments . . . . .		3—total area 18½ acres
17.	Number of shops . . . . .		499

ESTIMATED NUMBERS OF INSURED MALES AND FEMALES, AGED 14-64,  
IN THE PRINCIPAL INDUSTRIES IN JULY, 1939

(Note: The figures are based on the numbers of un-employment books exchanged in July, 1939, and include persons unemployed at the time of the annual exchange as well as those actually at work.)

Industry.	Males.	Females.	Remarks.
General engineering, etc.	4,040	1,030	Chiefly concerned in the manufacture of ball and roller bearings, steam boilers, agricultural implements and disintegrators.
Farming, forestry, etc.	1,090	40	
Building	590	—	
Drink industries	570	10	Two breweries.
Mining and quarrying	390	10	Chiefly the mining, by surface working, of gypsum,—the overburden being clay is manufactured into bricks.
Food industries	200	40	
Local Government service	190	30	
Goods transport by road	120	—	
Construction and repair of motor vehicles, cycles and aircraft	140	10	
Chemicals	110	20	
Public works contracting, etc.	110	—	
Tailoring	60	280	
Hosiery	60	100	
Dressmaking and millinery	20	280	
All other industries and services	1,670	820	
Total	9,360	2,670	

II. A TYPICAL TOWN OF ABOUT 50,000  
 INHABITANTS

Year . . . .	1921	1931	1936		1939	
Acreage . . . .	11,321	11,321	12,011		12,011	
Population . . . .	43,383	48,697	49,131		52,500	
Ditto Composite of age.			Male.	Female.	Male. (approx.)	Female. (approx.)
0-4 yrs. . . .	—	—	1,671	1,735	1,786	1,856
5-14 „ . . . .	—	—	3,531	3,369	3,776	3,600
15-19 „ . . . .	—	—	2,510	1,960	2,680	2,086
20-29 „ . . . .	—	—	5,325	4,320	5,700	4,620
30-64 „ . . . .	—	—	9,542	11,056	10,200	11,800
65-84 „ . . . .	—	—	1,645	2,299	1,760	2,456
85 and over . . . .	—	—	50	118	54	126
Total . . . .	—	—	24,274	24,857	25,956	26,544
Number of persons per acre . . . .	3.83	4.3	4.09		4.36	
Number of Wards in Borough . . . .	Four	Four	Four		Nine	
Number of Private Families (2 per- sons and over) . . . .	—	11,071	11,193		—	
Population in Priv- ate Families . . . .	—	39,903	40,333		—	
Number of Houses	9,264	10,520	12,272		13,106	
Number of Struc- turally separate dwellings occu- pied . . . .			10,640			
Ditto unoccupied . . . .			289			
Rooms occupied . . . .			58,824			

YEAR 1939

	Male.	Female.	Total.
Total number of population employed in industry . . . . .	14,485	4,485	18,970
Number of persons employed in the following main industries :			
Building . . . . .	1,597	8	1,605
General engineering . . . . .	1,119	24	1,143
Electrical . . . . .	209	74	383
Clothing manufacture . . . . .	169	676	845
Distribution trades . . . . .	2,268	1,050	3,318
Government, Services . . . . .	817	57	874
Local services . . . . .	1,374	327	1,701
Mental hospitals . . . . .	365	351	716
Laundries . . . . .	74	260	334
Printing . . . . .	500	271	771
	8,492	3,098	11,690

YEAR 1939

	Male.	Female.	Total.
Total number of persons employed in <i>Local Services</i> comprised as follows :			
L. & N.E. Rly. . . . .	125	72	197
Gas Co. . . . .	174	4	178
Eastern National Bus Co. . . . .	165	4	169
Municipal—			
Transport Dept. . . . .	117	4	121
Electricity Dept. . . . .	142	3	145
Education . . . . .	70	145	215
Highways Dept. . . . .	215	—	215
Water Dept. . . . .	31	—	31
Harbour . . . . .	10	—	10
Sewage works . . . . .	12	—	12
Cemetery . . . . .	11	—	11
Lighting Dept. . . . .	22	—	22
Housing Dept. . . . .	18	—	18
Police . . . . .	55	3	58
Parks . . . . .	27	—	27
I.D. Hospital . . . . .	7	36	43
Public lavatories . . . . .	9	8	17
Maternity Home . . . . .	1	14	15
Administrative, technical and clerical staffs for the above, i.e. Town Clerk, Borough Engineer, Medical Officer of Health, Borough Treasurer, Police, etc. . . . .	163	34	197
Total . . . . .	1,374	327	1,701

TYPICAL TOWNS

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	Number.
Houses . . . . .	13,106 (1,242 owned by Council)
Flats . . . . .	24
Churches . . . . .	22
Other places of worship . . . . .	13

	Elementary.	Secondary.	Private.
Schools . . . . .	19 (28 Depts.)	3	4

	Number.
Public libraries . . . . .	1
Hospitals (excluding military)	2 (one General County one Infirmary).
I.D. Hospital . . . . .	1
Maternity Home . . . . .	1
Workhouse . . . . .	1
Shops . . . . .	823
Public houses . . . . .	105
Residential hotels . . . . .	10
Fire Station . . . . .	1
Railway stations . . . . .	3
Municipal car parks . . . . .	3
Bus parks . . . . .	1
Cemeteries . . . . .	1
Public Swimming Baths . . . . .	1
Cinemas . . . . .	5
Seating accommodation of cinemas . . . . .	4,585
Private nursing homes . . . . .	2
Mental institutions . . . . .	5

Allotments.	Owned by the Council.		Leased by Council.	Private allotments.	Area reserved for allotments in T.P. Scheme.
	for allotments.	for other purposes, but used for allotments.			
Number of allotments	812	161	614	400	60 acres
Total area in acres .	64	15.5	49	69	

YEAR 1939

Public Open Spaces.

Area of existing public playing fields . . . . .	108 acres
Area of existing public open spaces (parks) . . . . .	38 "
Area of land owned by Council for public open spaces but not laid out . . . . .	94 "
Area of land proposed in T.P. Scheme for public open space . . . . .	43 "
Area of existing private playing fields and open spaces . . . . .	70 "

*Aerodrome.*

Area reserved in T.P. Scheme for Class A Municipal Aerodrome. (The larger portion of this has been acquired by the Council but not laid out viz : 203 acres.)

*Water.*

Excellent and plentiful supply obtainable from underlying chalk obtained from three boreholes each yielding 1,000,000 gallons per day and obtained from springs yielding 600,000 gallons per day; for average daily consumption of 36 gallons per day per person.

*Sewage Disposal.*

New Sewage Disposal Works have been constructed designed to treat D.W.F. 2,000,000 gallons per day and maximum rate of 12,000,000 galls per day partially. Sludge is treated on the digestion principal. The Methane gas produced provides the necessary fuel for driving the pumping engines, generating electricity and heatings.

*By-pass Road.*

Constitutes part of the London- . . . . . Trunk Road.

*Refuse Disposal.*

Refuse Disposal is now carried out by Control tipping, but we have prepared a Scheme for sorting, screening and composting the residue with digested sludge on the "Savital" system. This proposed scheme has not been before the Council yet and presumably there will be difficulties during the war period in carrying it out and possibly the Ministry of Health would not approve such a scheme at the present time.

*Street Lighting.*

	Number.	
Electric-tungsten lamp	. 912	various wattages.
Electric-sodium lamp.	. 237	various wattages.
Electric-mercury lamp	. 13	various wattages.
Incandescent gas lamp	. 615	

Just prior to the war several roads were lighted by sodium lamps in accordance with recommendations laid down by the Departmental Committee of Ministry of Transport in their final report dated 1937.



### III. A TYPICAL TOWN OF ABOUT 100,000 INHABITANTS

1. Population . . . . .	103,700
2. Sex and age composition of population tion . . . . .	See Statistical Tables attached
3. Number of families . . . . .	ditto
4. Total number of population employed in industry . . . . .	ditto
5. Total number of population employed in local services (municipal, transport, commercial, etc.) . . . . .	ditto
6. Existing industries, the nature of each, and the number of employees (dis- tinguishing between male and female) in each . . . . .	ditto
7. Local services, the nature of each and the number of employees (distingu- ing between male and female) in each . . . . .	ditto
8. Number of houses . . . . .	27,800
9. Number of flats . . . . .	362 (Corporation)
10. Number of churches . . . . .	See list attached
11. Number of schools . . . . .	ditto
(a) elementary . . . . .	
(b) secondary . . . . .	
12. Number of public libraries . . . . .	5
13. Number of public swimming baths . . . . .	3
14. Seating accommodation of cinemas . . . . .	See list attached
15. Area of public open space . . . . .	427—0—19p.
16. Number of allotments . . . . .	2,300 (Corporation)
17. Number of shops . . . . .	1,775, houses and shops 584, Lock-up shops

## STATISTICAL TABLES

TABLE 1. CENSUS POPULATIONS, 1801-1931

Date of Census.	Enumerated population.	Intercensal increase.
1801. March 9/10 . . . . .	7,020	—
1811. May 26/27 . . . . .	8,427	1,407
1821. May 27/28 . . . . .	10,793	2,366
1831. May 29/30 . . . . .	15,349	4,556
1841. June 6/7 . . . . .	21,242	5,893
1851. March 30/31 . . . . .	26,657	5,415
1861. April 7/8 . . . . .	32,813	6,156
1871. April 2/3 . . . . .	41,168	8,355
1881. April 3/4 . . . . .	51,881	10,713
1891. April 5/6 . . . . .	61,012	9,131
1901. March 31/April 1 . . . . .	87,021	26,009
1911. April 2/3 . . . . .	90,064	3,043
1921. June 19/20 . . . . .	90,895	831
1931. April 26/27 . . . . .	92,341	1,446

TABLE 2. CENSUS STATISTICS RELATING TO MUNICIPAL WARDS, 1931

Wards (as existing before Extension).	Population 1931.			Compared with 1921.	Area in acres.	Persons per acre.	Separate Dwellings Occupied.	Persons per Room.
	Males.	Females.	Total.					
A. . . . .	2,846	3,415	6,261	- 127	298	21.0	1,764	0.59
C. . . . .	4,218	4,235	8,453	-1,509	145	58.3	1,939	0.84
D. . . . .	3,559	3,709	7,268	+2,017	382	19.0	1,746	0.77
K. . . . .	5,096	6,002	11,098	+5,042	454	24.4	3,013	0.67
K. . . . .	4,445	4,934	9,379	+2,307	584	16.1	2,410	0.75
N. . . . .	4,060	4,073	8,133	-1,291	99	82.2	1,913	0.74
St. C. . . . .	2,828	3,107	5,935	-1,448	79	75.1	1,513	0.67
St. E. . . . .	2,759	3,214	5,973	- 877	98	60.9	1,633	0.64
St. J. . . . .	4,681	4,943	9,624	+ 411	398	24.2	2,373	0.72
St. L. . . . .	3,013	3,577	6,590	- 736	277	23.8	1,672	0.69
St. M. . . . .	3,366	3,978	7,344	-1,254	103	71.3	1,924	0.61
S. . . . .	2,874	3,409	6,283	-1,029	552	11.4	1,241	0.77
County Borough .	43,745	48,596	92,341	+1,446	3,469	26.6	23,141	0.70

TYPICAL TOWNS

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TABLE 3. CENSUS STATISTICS RELATING TO AGE AND SEX AND MARITAL CONDITIONS, 1931

Quinquennial age groups.	Numbers.			Percentages. <sup>1</sup>		
	Males.	Females.	Total.	Males.	Females.	Total.
0-4 . . . . .	2,859	2,921	5,780	6.5	6.0	6.3
5-9 . . . . .	3,516	3,523	7,039	8.0	7.3	7.6
10-14 . . . . .	3,568	3,253	6,821	8.2	6.7	7.4
15-19 . . . . .	3,704	4,009	7,713	8.5	8.3	8.4
20-24 . . . . .	3,671	4,197	7,868	8.4	8.6	8.5
25-29 . . . . .	3,639	3,953	7,592	8.3	8.1	8.2
30-34 . . . . .	3,416	3,940	7,356	7.8	8.1	8.0
35-39 . . . . .	3,174	3,824	6,998	7.3	7.9	7.6
40-44 . . . . .	2,995	3,515	6,510	6.9	7.2	7.0
45-49 . . . . .	2,812	3,300	6,112	6.4	6.8	6.6
50-54 . . . . .	2,666	3,049	5,715	6.1	6.3	6.2
55-59 . . . . .	2,465	2,667	5,132	5.6	5.5	5.6
60-64 . . . . .	1,937	2,148	4,085	4.4	4.4	4.4
65-69 . . . . .	1,480	1,676	3,156	3.4	3.4	3.4
70-74 . . . . .	970	1,276	2,246	2.2	2.6	2.4
75-79 . . . . .	562	788	1,350	1.3	1.6	1.5
80-84 . . . . .	225	393	618	0.5	0.8	0.7
85-89 . . . . .	76	125	201	0.2	0.3	0.2
90-94 . . . . .	9	37	46	0.0	0.1	0.0
95 and over . . . . .	1	2	3	0.0	0.0	0.0
All ages . . . . .	43,745	48,596	92,341	100.0	100.0	100.0
Marital conditions :						
Single . . . . .	20,825	23,018	43,843	47.6	47.4	47.5
Married . . . . .	21,064	21,186	42,250	48.1	43.6	45.7
Widowed . . . . .	1,820	4,354	6,174	4.2	8.9	6.7
Divorced . . . . .	36	38	74	0.1	0.1	0.1

<sup>1</sup> Sex percentages—Males 47.4; Females 52.6.

TABLE 4. CENSUS, 1931. AGE AND CONDITION DISTRIBUTION, COMPARED WITH FIGURES FOR 1921

Sex and Census year.	Age distribution per 1,000 of each sex.				Marital condition per 1,000 of each sex.		
	0-4.	5-19.	20-39.	40-	Single.	Married.	Widowed and Divorced.
<i>Males :</i>							
1931 . . .	65	247	318	370	476	482	42
1921 . . .	86	270	309	335	511	448	41
<i>Females :</i>							
1931 . . .	60	222	327	391	474	436	90
1921 . . .	70	256	341	333	512	405	83

TABLE 5. DATA FROM 1931 CENSUS VOLUME, COMPARED WITH FIGURES FOR 1921

	1931.	1921.
(a) Enumerated population . . . . .	92,341	90,895
(b) Intercensal increase . . . . .	1,446	831
(c) Rate of increase per cent. . . . .	1.6	0.9
(d) Number of males . . . . .	43,745	42,871
(e) Number of females . . . . .	48,596	48,024
(f) Number of females per 1,000 males . . . . .	1,111	1,120
(g) Average age of males (years) . . . . .	33.4	31.1
(h) Average age of females (years) . . . . .	34.7	31.9
(i) Persons per acre . . . . .	26.6	26.2
(j) Parliamentary electors . . . . .	62,577	44,306
(k) Private families . . . . .	24,966	21,979
(l) Separate dwellings occupied . . . . .	23,141	19,893
(m) Excess of families over private dwellings occupied . . . . .	1,825	2,086
(n) Population in private families . . . . .	89,139	88,179
(o) Percentage of population in private families . . . . .	96.6	97.0
(p) Rooms occupied by private families . . . . .	127,222	112,410
(q) Average number of persons per room . . . . .	0.70	0.78
(r) Average size of occupied dwelling (rooms) . . . . .	5.50	5.65
(s) Average family occupation (rooms) . . . . .	5.10	5.11
(t) Families per occupied dwelling . . . . .	1.08	1.10
(u) Average size of Private family (persons) . . . . .	3.57	4.01
(v) Population in private families living more than two-per-room density . . . . .	1,784	2,393
(w) Percentage of population in (v) . . . . .	2.00	2.71
(x) Dwellings occupied by one private family . . . . .	21,395	17,891
(y) Dwellings occupied by two private families . . . . .	1,686	1,925
(z) Dwellings occupied by three or more private families . . . . .	60	77

TABLE 6. CHANGES IN AREAS BY EXTENSIONS OF BOROUGH ON 1ST APRIL, 1932

Areas diminished.	Acreage (land and inland water).	Census populations.	
		1921.	1931.
B.R.D.	606	130	220
Part of B.C.P.			(59)
Part of M.C.P.			(161)
H.R.D.	202	5	3
Part of H.C.P.			(3)
N.R.D.	1,924	983	3,982
Part of D.C.P.			(293)
Part of D.C.P.			(324)
Part of W.C.P.			(3,365)
Added to N.C.B.	2,732	1,118	4,205

TABLE 7. SEX AND AGE DISTRIBUTION OF POPULATION AT CENSUS, 1931, IN AREA TRANSFERRED TO THE BOROUGH ON 1ST APRIL, 1932

Quinquennial age-groups.	Males.	Females.	Total.
0-4	224	203	427
5-9	250	235	485
10-14	196	175	371
15-19	148	212	360
20-24	123	208	331
25-29	159	210	369
30-34	204	227	431
35-39	177	198	375
40-44	127	148	275
45-49	116	108	224
50-54	77	107	184
55-59	67	63	130
60-64	49	42	91
65-69	35	38	73
70-74	21	19	40
75-79	8	16	24
80-84	4	3	7
85 and over	3	5	8
All ages	1,988	2,217	4,205

TABLE 8. CLASSIFICATION OF THE CHIEF INDUSTRIES IN WHICH PERSONS ENUMERATED IN THE BOROUGH WERE ENGAGED IN 1931, COMPARED WITH 1921<sup>1</sup>

Chief Industries.	1931.		1931.	1921.
	Males.	Females.	Totals.	Totals.
Farming and market gardening	250	5	255	245
Other gardening	154	14	168	152
Manufacture of blue and polishes	51	40	91	154
Iron and steel foundries	237	3	240	339
Engineering (not marine or electrical)	658	57	715	1,053
Electrical installations, cables and apparatus	104	52	156	118
Construction and repair of vehicles	676	94	770	1,426
Other metal industries	97	8	105	191
Fellmongery, tanning and leather dressing	792	192	984	939
Manufacture of saddlery, harness bags, trunks and other leather goods	80	72	152	206
Tailoring	197	321	518	545
Manufacture of boots, shoes and slippers (not rubber)	8,864	5,876	14,740	17,386
Manufacture of clogs	25	9	34	
Manufacture of other clothing (not knitted)	64	971	1,035	1,315
Manufacture of food	526	120	646	548
Manufacture of drink	529	55	584	765
Wood working and basket ware	274	25	299	483
Dealing in timber	157	10	167	
Cabinet and furniture making, shop fitting, etc.	399	35	434	253
Manufacture of cardboard boxes, paper bags and stationery	51	192	243	352
Printing, bookbinding and photography	636	321	957	897
Building and contracting	1,875	25	1,900	2,469
Other manufacturing industries	206	53	259	135
Gas, water and electricity	757	26	783	639
Railway transport	1,106	19	1,125	1,297
Road transport	714	22	736	422
Dealing in coal	184	14	198	146

<sup>1</sup> The information in this Table has been extracted from the Industry Tables prepared by the Registrar-General in connection with the Censuses of 1921 and 1931. The figures in 1921 refer to persons 12 years of age and over and in 1931 to persons 14 years and over. The statistics for the boot and shoe industry include clog-makers in 1921 but not in 1931. Persons out of work in 1921 were not tabulated separately. All the classifications relate to the industries of persons enumerated in N., but the businesses were not necessarily situated within the borough.

Chief Industries.	1931.		1931.	1921.
	Males.	Females.	Totals.	Totals.
Dealing in sugar confectionery . . . . .	58	85	143	96
Dealing in tea, coffee, grocery and provisions . . . . .	493	164	657	574
Dealing in milk and dairy products . . . . .	224	32	256	198
Dealing in meat . . . . .	429	35	464	351
Dealing in fish and poultry . . . . .	142	13	155	119
Dealing in vegetables and fruit . . . . .	156	68	224	171
Dealing in Tobacco . . . . .	48	42	90	77
Dealing in drugs and druggists sundries . . . . .	108	42	150	125
Dealing in metals, metal goods and tools . . . . .	169	34	203	226
Dealing in Textiles and clothing, drapery, hosiery, etc. . . . .	337	543	880	1,024
Dealing in boots and shoes . . . . .	131	92	223	146
Dealing in skins, leather and leather goods . . . . .	251	74	325	308
Dealing in furniture . . . . .	189	47	236	210
Publishing, dealing in paper, stationery, newspapers, books . . . . .	137	84	221	195
General and export trading and non-textile packing . . . . .	92	22	114	118
Departmental stores, general shops and like mixed business . . . . .	375	135	510	373
Other and undefined dealings . . . . .	278	253	531	262
Banking and bill discounting houses . . . . .	92	25	117	113
Insurance . . . . .	273	64	337	221
Other commerce and finance . . . . .	145	24	169	148
Defence . . . . .	282	5	287	547
Central civil government . . . . .	334	93	427	
Local government . . . . .	1,721	421	2,142	1,493
Professions . . . . .	742	733	1,475	1,256
Entertainments and sports . . . . .	267	122	389	225
Private domestic service . . . . .	168	1,772	1,940	1,500
Lodging and boarding-houses . . . . .	18	107	125	
Restaurants, hotels, public-houses, clubs . . . . .	426	372	798	935
Laundries, dyeing, and dry-cleaning . . . . .	56	173	229	172
Hairdressing, manicure and chiropody . . . . .	121	90	211	120
Other personal service . . . . .	120	55	175	76
Other industries or industry not stated . . . . .	80	14	94	13
Total population—all ages . . . . .	43,745	48,596	92,341	90,895
Under 14 years of age in 1931. (Under 12 in 1921) . . . . .	9,239	9,012	18,251	17,738

Chief Industries.	1931.		1931.	1921.
	Males.	Females.	Totals.	Totals.
Aged 14 years and over in 1931. (12 and over in 1921) . . . . .	34,506	39,584	74,090	73,157
Unoccupied and retired . . . . .	2,724	24,029	26,753	28,307
Out of work (excluded from industry classification) . . . . .	2,908	903	3,811	
Total of industries (excluding persons out of work) . . . . .	28,874	14,652	43,526	
Persons aged 14 years and over in 1931 (12 and over in 1921) engaged in the manufacture of boots, shoes and slippers (not rubber)—excluding persons out of work :				
England and Wales . . . . .	131,839	52,895	184,734	198,267
N. . . . .	8,864	5,876	14,740	17,386
N. figures expressed as a per- centage of England and Wales	6.7	11.1	8.0	8.8

## CHURCHES

Church of England.	Roman Catholic.	Free Churches.			Unitarian.
		Baptist.	Methodist.	Congrega- tional.	
19	3	11	14	6	1

Various others including: Jewish Synagogue, Salvation Army and Spiritualist Churches, etc.

## SEATING ACCOMMODATION IN CINEMAS

Savoy . . . . .	1954	Regal . . . . .	799
Exchange . . . . .	1920	Temperance . . . . .	634
Ritz . . . . .	828	Roxy . . . . .	500
Tivoli . . . . .	853	Coliseum . . . . .	675
Plaza . . . . .	595	New Theatre . . . . .	1,513
Picturedrome . . . . .	628	Repertory Theatre . . . . .	752
Cinema de-Luxe . . . . .	940		

## NUMBER OF SCHOOLS

- (a) 20 Provided. 8 Non-Provided. (Including Open Air School and Nursery Schools).
- (b) Technical College; School for Girls; School of Art; Town and County School. N. School for Girls, E. College, Convent, etc.



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