

# C O N T E N T S

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COVER ILLUSTRATION: THE UNION OF SOUTH AFRICA AND PART OF THE UNITED STATES OF AMERICA,  
INDICATING THE AREA ADMINISTERED BY THE TENNESSEE VALLEY AUTHORITY AND  
THE LOCATION OF THE GREENBELT TOWNS.

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## SOUTH AFRICAN ARCHITECTURAL RECORD

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# THE YEAR IN REVIEW

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It is three years since a commentary of this nature appeared in the pages of the "Record." Then, it was overshadowed by the outbreak of war, and everyone found themselves confronted with those grave issues which they could scarcely appreciate.

At that time a parallel was drawn to the conditions which obtained at the beginning of the war of 1914-1918. Previous to that time the seeds of new architectural philosophy had been sown, which, subsequently, were to flourish during that period of post-war realism. The stream of this new philosophy seeped widely and produced a constantly spreading flow of vital architectural thought, which found expression in the work of architects in Europe, in America, and in this country. But the direction of the future development in South Africa, in 1939, was mere conjecture. The "boom" period in the building industry had passed, and the volume of work in that year had shown a marked decrease. A guess was hazarded as to the future of the architect—one in terms of a corporate profession concerned with the co-ordinated development of national services, of social reconstitution and organised industrial planning, embracing the broadest interpretation of human requirements.

What of the present position in South Africa? Periods of unrelated and untimely optimism have given rise to deceptive complacency, only to be rudely shattered by a renewed consciousness of the rigours of the present conflict. The repercussions have had a profound effect on the architectural productivity of this country. With the necessary introduction of national control and restriction of building materials the incidence of new construction under the control of an architect has been limited to national and social necessity. Although the profession has played and is playing a vital part it has, to a large extent, become scattered and is not at the present time, the intact body whose synoptic view may be directed towards the co-ordination of national enterprise. Many of its members have left to fill positions created by the present emergency, in both military and civil organisations, and a large number are serving with the fighting forces.

Conscious of its responsibilities towards members of the Institute serving in the forces, the Central Council, early this year, appointed a liaison officer, in the person of Mr. A. S. Furner. His work in this respect has been of great value to the Institute, and to members, in correcting occupational anomalies

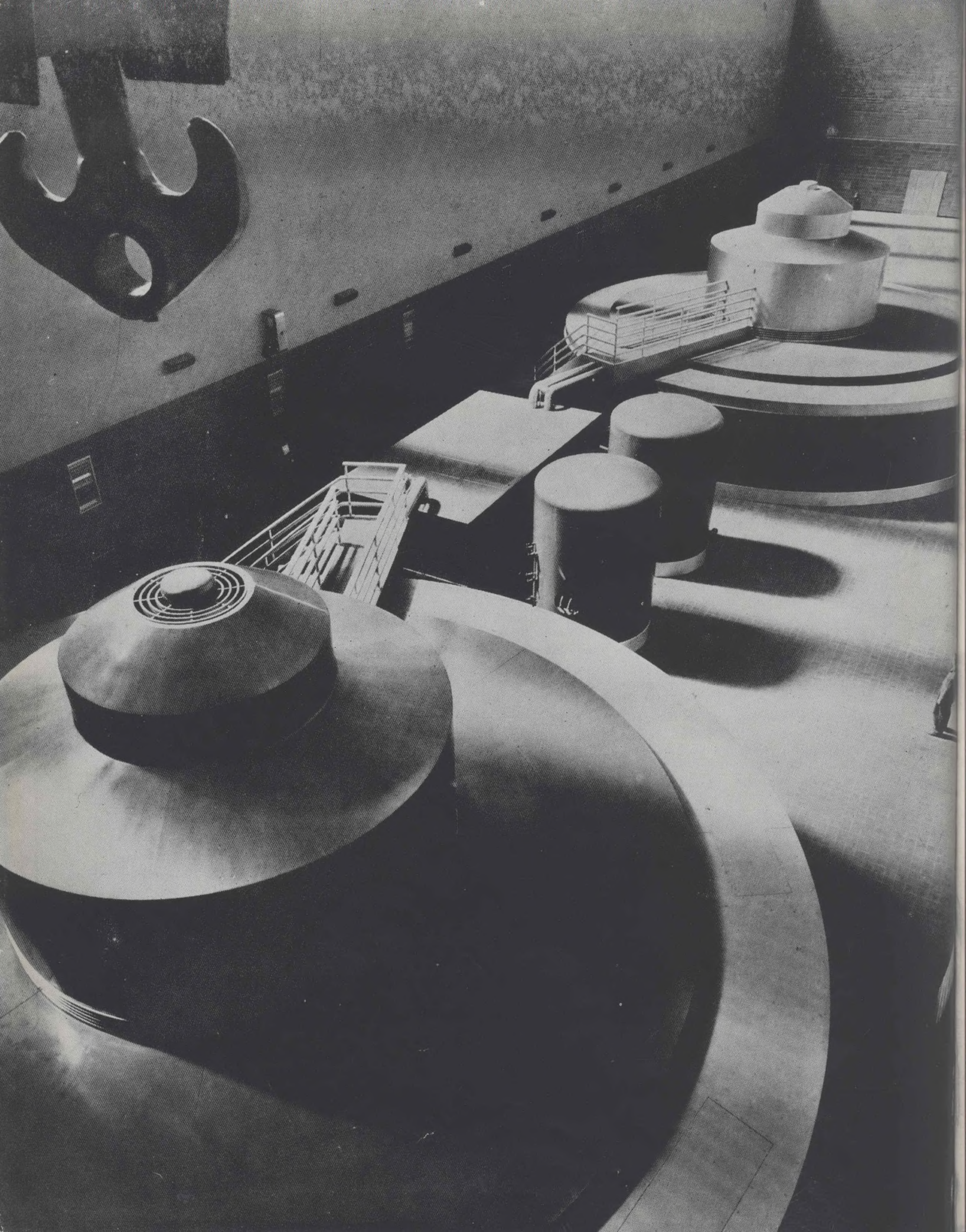
and in assisting members desirous of entering those branches of the service, for which their professional training best suits them. Those who remain to carry on the work of the profession, faced as they are with the exigencies of present circumstances, have no easy task to perform; and while practice is beset with boundless difficulties, it is not surprising to find more than a tinge of austerity colouring Institute activities. To resort to a familiar platitude, things are likely to be worse before they are better.

But the outlook would appear to display a glow of future promise, for there is an apparent and increasing recognition of the part that the architect can play in shaping the national environment during the "reconstruction" that peace must bring. In this respect, too, the Central Council has acted with commendable foresight, and has appointed Committees, whose function, in the one instance, is to survey and investigate the broad and urgent question of housing, both economic and sub-economic, in this country; and in the second, whose activities are to be directed towards research into building materials, both matters of a vital national character. Wrapped up as they are with the true rôle of the architect in contemporary society, it is to be hoped that their work will meet with full and deserving recognition; for it is evident that the architect, whose training and practice can give direction and validity to such investigations, is the one best equipped to undertake them. Let us hope, too, that out of such moves we may see "Housing" emerge on a new plane of humanity and social consciousness, and that we may see the establishment of a Building Research Station, with authoritative status, for the research into and investigation and development of the natural and technical resources of this country.

There is, too, the heartening sign that the services of the professional and technical man, so seldom co-ordinated and organised in the past, are likely to be used to a greater national advantage. Too often have the sociological developments in this country been in the hands of chance, guided perhaps by palliative authority, and with an impersonality which has ignored the breadth of national life, and the plaintive plea of the under-privileged individual. Too often have opportunities been lost by a misplaced enthusiasm and inefficient control.

Should it occur, then, that the new-found confidence in co-ordinated professional and technical knowledge throws a grave responsibility on the shoulders of the architect, the profession must fit itself, both collectively and individually, to meet the position and approach our national problems from the total, the regional and synoptic viewpoint; and by seeking further than individualist opportunism, become the architects of our future.







# NATIONAL PLANNING, WITH PARTICULAR REFERENCE TO REGIONAL PLANNING, TOWN PLANNING AND HOUSING

by G. E. Pearse

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A paper read at Kelvin House, on September 2nd, to the Association of Scientific and Technical Societies of South Africa, by whose kind permission the paper is published in this Journal

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When I agreed to read a paper on Regional Planning I did not fully realise the magnitude of my task. On second thoughts I decided to change the title of my paper to National Planning and, under this heading, to discuss generally the subjects of Regional Planning, Town Planning and Housing, all of which are inseparably bound up with the main issue, namely, National Planning.

## N A T I O N A L P L A N N I N G

The world to-day is passing through a cataclysm which it has never experienced before.

Vast armies are locked in a life and death struggle and every Government is considering the aftermath and what should or must be done to avoid a recurrence of the horrors with which we are faced.

National Planning seems to me to be one of the first considerations and, I feel sure that our Prime Minister in appointing a Social and Economic Planning Council, realised that this is a time in which we must take stock and National Planning means, in the first place, taking stock.

To do this a comprehensive survey must be made of one's national resources—a study of what is required to enable a nation to exist and to be, as far as possible, independent of other countries, and a scheme prepared, not only to improve and develop to the fullest extent what one has, but to investigate the possibilities of producing what one lacks.

Great Britain and the Dominions have done little or nothing in this respect compared with other countries.

In fact the British Government, only in February of this year, appointed a Minister of Planning.

In this connection Mr. Arthur Greenwood stated in the House of Commons that "The Minister's planning functions will be to guide the formulation by local authorities of town and country planning schemes which will adequately reflect

the national policy for urban and rural development . . . In reaching these decisions, he said, the Government's intention has been to secure the most appropriate development and use of the land of this country and they believe that by a procedure of this kind the various activities of the Departments concerned in post-war reconstruction, including the speedy provision of houses for those who need them, the re-building of devastated areas, the clearance of slums, the relief of overcrowding, the provision of all necessary public services and the general promotion of rural development in the light of a positive policy of a healthy and well balanced agriculture, can be welded into a single and consistent policy.

The Government will review the objections stated in the Report of the Royal Commission on the Distribution of the Industrial Population, viz. :

(a) Continued and further re-development of congested urban areas, where necessary.

(b) Decentralisation or dispersal, both of industries and industrial population from congested areas.

(c) Encouragement of a reasonable balance of industrial development, as far as possible, throughout the various divisions or regions of Great Britain, coupled with the appropriate diversifications of industry in each division or region throughout the country.

In particular the Government :

(a) Will seek to ensure that fresh development is planned with due regard to the use which can be made of existing capital equipment and existing capital services, and will not wantonly countenance the break up of old and valuable industrial concentrations.

(b) Will seek to avoid the diversion of productive agricultural land to other purposes if there is unproductive or less productive land that could reasonably be used for these purposes."

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OPPOSITE: The T.V.A. Powerhouse at Pickwick, illustrates an excellent improvement in the design of generators, and it is particularly striking in colour: generators are dark green and white metal, wainscot is green and the walls are lemon yellow and light green.

In the House of Lords, Lord Reith stated that the new bill was based on the recommendations of the Uthwatt interim report namely :

1. The extension of planning and planning control over the whole country.

2. The improvement of planning areas, encouraging planning authorities to group in suitable areas as units (i.e., Regional Planning).

3. The strengthening of interim development control . . . (i.e., control before a planning scheme was operative).

Planning, he said, must work to national policies—to be determined—for agriculture, industry, and transport. These had to be decided to some extent outside planning, but planning issues had to be taken into account in formulating economic policy.

Finally he emphasised that planning was a notable and urgent war matter.

Time does not permit me to say very much about what other countries are doing but I should like to refer briefly to the efforts of Russia and the United States of America.

In the case of the former, more has been done than merely taking stock, for the U.S.S.R. has not only done this, but with its vast plans, Economic, Industrial, Agricultural and Educational, it has definitely put its proposals into effect.

It is largely due to the tremendous development in Russia that the Government was able to cope with the magnitude of its war effort.

In other words the organisation already existed.

It is difficult, unless one has visited the U.S.S.R. to grasp the magnitude of the task which has been undertaken, but the fact that this great country, covering one sixth of the globe, and with a population of some 170,000,000 has achieved such stupendous results, and is able to check, to some extent, the greatest armed force in history, gives one food for thought.

The Government of the U.S.S.R. set to work as far back as 1917, when it was faced with enemies on seven fronts, to collect information of the resources of the country and to develop them to the fullest extent.

"Two things," says the Dean of Canterbury in his book "The Socialist Sixth of the World," "stood out as of paramount importance : national safety, and the power to produce. The nation, we must recollect was starting from scratch ; industry had shrunk to an insignificant trickle, industrial plants were destroyed, fields laid waste. The nation was short of a host of commodities, but war supplies were pre-eminently needed . . ." "The bulk of Russian industrial energy must be turned, and turned immediately, to the provision of war supplies . . ." "That involved prolonged and necessary

hardship. There was bound to be a drastic tightening of the belt . . ."

Yet, for all that, men cannot live by capital goods and armaments alone . . ." "All the remaining energy and resources of the nation's economy, then, must be expended on cultural and sustenance needs ; which, however, were necessarily, in view of the two paramount needs of defence and capital goods, kept in short supply . . ."

Such, in broad outline, was the plan as it was formulated at the Supreme Economic Council of Public Economy, which was picturesquely described by Mr. Phillips Price as "the first organ, in the world for carrying out in practice the theory that each citizen is part of a great human family, and has rights in that family, in so far as he performs duties to it . . ."

"Consequently, on December 5th, 1917, a body called the Supreme Council of Public Economy, was appointed, with exceedingly wide powers, to produce general plans and estimates which should regulate the entire economic life of the country. This plan had its eye from first to last upon the needs of consumers ; whether the army, which needed supplies ; industry, which needed metals and machines ; agriculture, which needed ploughs and tractors, or the common man, who needed bread, boots and books."

Every region presented its own problems, language as well as resources, and to each were sent Scientists and Technicians to explore and report, on what was required. These reports were submitted to the Supreme Council whose duty it was to co-ordinate them with the National Plan.

Time does not permit me to discuss these schemes and results in detail. They have been published by scientific and literary men in every country in the world. Suffice it to say that what this country has done and is doing is a great lesson to every other country.

In the United States of America, National Planning was commenced in 1934, and the results so far have consisted in collecting data of the National Resources of that great country of some 120 millions.

The National Resources Board was set up by the United States Government in 1934, and since then the work has been carried on to a large extent by the States themselves. The title of the National Resources Board was changed later to that of the National Resources Planning Board, now the National Resources Committee, and each State is sending in its investigations and theories or proposals to this Federal Committee. It, in turn, collects information from other sources and publishes reports from time to time.

It is interesting to note that this Committee is composed of what one might term Secretaries of State, but the advisory committee and staff are technical and scientific specialists,



not civil servants.

The reports make fascinating reading and deal with the following : Population, Consumption, Production, Transportation, Communication, Energy, Land, Forest, Recreation and Wild Life, Water, Minerals, Research, Invention, Health, Education, Housing, Libraries and Museums, Strategic and Critical Materials, Public Works and Sources of Materials. The object of these Committees, National and State, it is stated, is "to prepare and present to the President a programme and plan of procedure dealing with the physical, social, governmental, and economic aspects of public policies for the development and use of land, water, and other national resources and such related subjects as may from time to time be referred to the Board by the President."

In this country with our comparatively small and widely scattered population it is easy to obtain all the information required for National planning, in fact, a great deal of it is already available, but it is necessary to develop existing data to the point of scientific accuracy.

We are woefully ignorant of many of the basic facts—those, for example, dealing with our native population, whose very numbers are not known. Statistical research should be encouraged to the fullest extent.

A master plan on regional lines (a subject I shall deal with later) could then be prepared, which takes account of known facts—our human and natural resources—anticipates industrial and agricultural developments, and co-ordinates regional planning within the frame work of national, social and economic advancement. Such a plan should necessarily be made as flexible as possible.

To carry out such a task savours of Socialistic planning but I think you will agree that the present unsatisfactory piecemeal and haphazard development cannot be continued and a social basis for planning must be established. Our fighting forces after the last war were completely disillusioned and I feel sure that after this war they will be entitled to a fairer deal. I feel sure, too, that this was in the Prime Minister's mind when he set up a Social and Economic Council under the able chairmanship of Dr. van Eck.

With this very brief outline I must leave the question of National Planning and pass on to the subject of Regional Planning which is an integral part of the former and gives expression to it.

## REGIONAL PLANNING

The term Regional Planning may be defined as planning a region or district to coordinate the existing resources, whether human, industrial, agricultural, urban, natural and man created, for the benefit and use of present and future generations.

In carrying out such a scheme the fullest co-operation between Governmental, Provincial, Local, Industrial and Educational authorities is essential, otherwise the scheme must be a complete failure. One of the greatest factors militating against such a scheme is the local authority, whose officials are often, and quite understandably, jealous of long-standing privilege. Such parochialism may prove an obstruction in putting into effect planning measures. It is obvious, therefore, that an over-riding authority must be set up, such as a Regional Board, but the experience and knowledge of the local authority should be fully utilised in the functioning of the Regional authority.

The European population of South Africa is not much greater than that of many large industrial or commercial cities overseas, whilst the population of our largest towns or cities is not as great as that of many provincial cities in Great Britain.

It is obvious, therefore, that we are in a more favourable position than those more densely populated countries and have a greater opportunity of planning for the future.

Regional Planning has been proposed or carried out in many countries and from these schemes it is possible to gain valuable experience to guide us in South Africa.

In Great Britain most of the proposals have not gone much further than the report stage. In Russia and the U.S.A. several interesting schemes have been carried out.

The work of a Regional Planner may be divided into four stages, summarised as follows :

(1) A survey of the region, its geographic setting, its climatic and meteorological facts, its economic processes and its historic heritage.

(2) A critical outline of needs and activities in terms of social ideals and purposes.

(3) Imaginative reconstruction and projection. On the basis of known facts, observed trends, estimated needs, critically formulated purposes, a new picture of regional life is now developed.

(4) The intelligent absorption of the plan by the community and its translation into action through the appropriate political and economic agencies.

Regional plans like the National plan must provide in their very constitution the means of future adjustments. The plan that does not leave the way open to change is scarcely less disorderly than the aimless empiricism that rejects plan. Renewal: flexibility: adjustment: these are the essential attributes of all organic plans.

To illustrate Regional planning, I propose referring to two schemes, the first a typical region in England, and the second an interesting scheme, which has been carried out in the

## U.S.A.

The Bristol and Bath Regional Plan was prepared by Patrick Abercrombie, who is responsible for a number of Regional Plans in Great Britain, and Bertrand Brueton. This scheme was published in 1930, but has not gone very much further than the report stage.

In their report the authors state :

"The main object of a plan is to provide a reasoned basis for future growth, founded on the varied factors which exist to-day. It is of necessity a forecast, an attempt to visualise the future, and it sets forth the means by which this line of growth is to be organised or directed. But it is clear that the less compulsion that is necessary, the better : a plan which interferes at every point with natural tendencies and which requires vexatious rules and regulations would not only meet with opposition, but would stand small chance of being adequately realised, unless in the hands of a Dictator. What is required is to stimulate natural tendencies in the right direction, only opposing a flat negative where public health or general convenience or paramount claims of amenity demands it."

The report deals fully with Zoning, Communications, Open Spaces and Public Services, and finally recommends the appointment of an advisory committee consisting of representatives of the following :—Local Authorities, Local Land-owners, Industrialists, Electricity Companies, Chambers of Commerce, Labour Organisations, Transport Companies, and Architectural Societies.

The Tennessee Valley Scheme in the U.S.A. is a unique experiment, frequently cited as the most significant of the "new deal" developments. "It is administered as a Government corporation, clothed with the powers of Government but possessed of the flexibility and initiative of a private enterprise," and carrying on a multiplicity of functions embracing the field of water control, power development and utilisation, fertiliser production, agricultural and industrial development, afforestation and soil erosion control, land planning and housing and social economic research.

Its direct influence has been felt by approximately 2,000,000 people living on the watershed, while additional millions in the adjoining territory are also affected.

The scheme came into being in 1933, when the United States Congress passed an Act "To improve the navigability and to provide for the flood control of the Tennessee River ; to provide for reforestation and the proper use of marginal lands in the Tennessee Valley ; and to provide for the agricultural and industrial development of the said valley."

It is interesting to note that the scheme was carried out by a joint committee of Architects, Engineers and Scientists.

This area, some 40,000 square miles in extent, had been denuded of forest and soil owing to uncontrolled development, with the resultant soil erosion. Farms, once prosperous, had fallen into a state of ruin, a condition of affairs common to many states in the U.S.A. and vividly described in John Steinbeck's book "The Grapes of Wrath."

Regional Planning can be applied to this country in various ways : for example :

(a) By treating each Province as a Region, and preparing independent schemes for approval and embodiment in the national plan.

(b) By dividing the whole country into regions, industrial, agricultural, forestry, native reserves, and recreational reserves and preparing schemes for each of these.

Such schemes would overlap to some extent but the National Plan would co-ordinate and correlate where necessary.

Take for example a region such as that in which we are living, bounded on the north by Pretoria, south by Vereeniging, and including the East and West Rand.

Between the established municipalities uncontrolled development is taking place, industrial, agricultural, commercial and housing. Much of this is deplorable, lacking such services as water, light and sewerage and forming the nucleus of slums which in course of time will be absorbed by the nearest local authority.

No attempt is being made to co-ordinate these with existing townships, with main roads or with public services.

The older and more historic parts of this country are also suffering, the Cape Peninsula with its superb scenery but straggling development along the coast, now controlled to some extent, Paarl and Stellenbosch, which were once a delight to early visitors to this country and whose picturesqueness is slowly being destroyed by uncontrolled growth. Surely it is our duty to preserve to the fullest extent our national heritage.

## T O W N P L A N N I N G

I come next to Town Planning a subject which concerns each of us more intimately and one which has been exercising the minds of Governments and Local Authorities for the past twenty-five or thirty years.

The term Town Planning was first used about the beginning of this century and is, a priori, a study in social organisation, the basis upon which to build a town. Towns grow, and it is only on rare occasions that they are built in accordance with a prearranged plan.

Town planning is not so much a science dealing with the completed structure as with its growth.

"It is the business of the Town Planner to anticipate growth,



to provide a scheme that is ahead of his time, to make arrangements for the reception and distribution of a town's industries, a town's houses, its places for recreation, and for all the other needs of the townsmen for many years to come. These things, considered broadly and systematically make the science of Town Planning. In its application, the arts of architecture and landscape design, and sciences dealing with sociology, civil engineering, and hygiene are contributory."

Haphazard methods, the result of land speculation and real estate development, should not be tolerated, but the town plan should be made to conform to the Regional and National plans, the town being, in fact, the nucleus of regional development.

One could say a great deal about Town Planning in the past, but, apart from studying the past with the hope of correcting the mistakes of the future, it would be a waste of time.

Suffice it to say that towns in the past, up to the end of the 18th Century were planned to meet the needs of the time and served their purpose very well, that is for defence or to satisfy the whims of aristocratic town rulers.

To-day we are faced with planning for industry and it is only since the beginning of this century that anything has been done in this respect.

The great industrial movement of the 19th Century brought about speculation and uncontrolled development with their attendant squalour, disease, and slums.

"Sheer necessity often caused the industrialist to build houses for his workmen when his plant was situated in the open country; this gave an opportunity for fresh initiative, and the work of Sir Titus Salt, at Saltaire, in the middle of the 19th Century, paved the way for later settlements such as those of Krupp, at Essen; Cadbury, at Bournville, and Lever, at Port Sunlight."

It was not until the end of the 19th Century when Ebenezer Howard, an enthusiast and philanthropist, published a book called "To-morrow," that public interest was awakened in the subject.

In this he outlined a scheme for founding a city which would enable townsmen to return to the land and obtain all the advantages of the country, combined with the interests of the town.

In a later edition of this work, entitled "Garden Cities of To-morrow," he went a step further and proposed the establishment of garden cities or balanced urban development.

He realised that the population of cities was rapidly increasing, that new quarters had to be provided every year for factories and factory workers, in centres that were so dismally congested and clothed with foul slums.

To counteract this he proposed:

1. That land in the garden city must be held by the common authority under which it was developed and that such increments which might arise through the growth of the garden city must be reserved for the community.

Not merely did Howard seek to eliminate the private landlord: he eliminated the temptation to increase density in order to raise land values.

2. That growth should be controlled and population limited. He proposed surrounding every garden city with a permanent reserve of open country, to be used for agriculture or recreation. This agricultural belt was not merely to serve as a green wall against the encroachment of other communities, it was to provide opportunity for local production of food, with a good market close at hand.

Once the area and density of a plan were determined, its upward growth was set. Howard put this figure at 30,000, but later it was increased to 50,000.

It is interesting to note that the model city of Aristotle was to be limited to a population of 20,000 whilst that of Leonardo da Vinci was fixed at 30,000.

3. That a functional balance should be maintained. In its regional relations, there was to be a balance between town and country; in its internal development there was to be a balance between home, industry and market, between political, social and recreational functions."

"Howard may be said to be the first modern thinker who had a sound sociological conception of the dynamics of modern thought."

The first fully developed garden city to be built according to Howard's proposals was Letchworth, which was founded in 1904, by a specially organised public utility association.

"Its success encouraged others to follow suit, but it was not until 1920 that the conditions for the success of the garden city became more favourable, for now the garden city was no longer an isolated biological sport: it was the concrete embodiment of our new methods and new processes as applied to city development. It was not confined to Great Britain. Wherever enlightened control made possible the building of large scale developments, Howard's conception became a potent influence: Hilversum, in Holland, the new satellite communities built by Ernst May in Frankfurt-am-Main, the new town of Radburn in New Jersey, and many new settlements in the U.S.S.R., embodied to a greater or lesser degree Howard's principles." This garden city movement did not, however, check in any way the growth of our towns and cities.

It was not until 1919 that Great Britain realised that it was necessary to control the planning of towns in order to improve the housing conditions of the population.

Since then traffic problems have become acute and for the past fifteen or twenty years a great deal of consideration has been given to this question.

The advent of the motor vehicle has done much to improve our roads and streets, but this, by increasing speed, has aggravated the problem still more and is one of the most serious questions we have to face in town planning to-day. Another important question is that of zoning which is concerned with :—

(a) Zoning for various purposes—Industrial, Civic, Commercial, Residential and Recreation.

(b) Zoning for coverage which is mainly concerned with coverage of sites in different areas and heights of buildings to prevent congestion.

All these questions are of the utmost importance to local authorities and have brought about the various town planning ordinances in the Provinces of the Union.

These are based upon the English Town Planning Acts.

The Transvaal was the first province to introduce Town Planning legislation and this was due to the efforts of the Transvaal Town Planning Association, a body inaugurated by the Association of Transvaal Architects and representative of the Architectural, Civil Engineering, Land Surveying and Medical Profession.

Unfortunately the provisions of the Ordinance leave much to be desired, and until Town Planning becomes linked up with Regional and National Planning little can be done to improve our present conditions and prevent the unfortunate blunders being perpetrated to-day.

## H O U S I N G

Finally I come to the question of Housing, or what one might term Planning for Health, a subject which concerns all of us and one which should be tackled systematically as a National and not a purely local problem.

Housing in our Urban areas in this country falls into three categories.

1. Housing of Europeans.
2. Housing of Asiatics and Coloured persons.
3. Housing of Natives.

Each of these presents its own problems but in each the question of environment should be given primary consideration.

Environment, I think you will all agree, affects all forms of life and there is no doubt that ugly forms and squalid conditions under which so large a proportion of our urban population spend their lives, lead to ill health, squalor and disease of which crime is the inevitable outcome.

The housing conditions of many workers in our industrial towns and surrounding our major industry are deplorable and call for improvement and it is regrettable to see in many of our more recent industrial undertakings, that the mistakes of the past are still being perpetrated. I have mentioned the Garden City movement which began in England at the beginning of this century and which to-day is playing a great part in urban development in England on the Continent and America.

This has been to a great extent the result of private enterprise and it is only comparatively recently that powers have been given to local authorities in England and South Africa to deal with slums and to borrow money for housing purposes.

These then are the two major problems facing us to-day. Slum clearance and housing.

In every country overseas the provision of open spaces is being given primary consideration in town planning and housing. In London a greenbelt is being established at great cost. In America greenbelt towns are being built as an experiment and have already proved economically sound—although the initial expenditure was undertaken by the State.

Leading architects and town planners in Europe and America are advocating the opening up of the central areas of towns and cities. Chicago and Philadelphia are doing it.

In England, Germany is doing it for us.

It has been estimated that the recreational area within towns should be at least one acre for 300 people, properly distributed. On this basis approximately 1,700 acres should be provided for Johannesburg.

In this country, however, it has become customary for Government and Local authorities to use our open spaces for building purposes.

The housing problem is not one problem, but a combination of interrelated problems.

Firstly, we must consider the social function of housing—the problem set by human needs, the desire to avoid unnecessary menial labour, the more conscientious and efficient child care, the recognition of play as an essential part of life from childhood onwards, the acceptance of the need for quiet and privacy, and zoning for family life.

Secondly, the economic function of housing—land values, building regulations, rates, cost of materials and labour, legal problems, adequate financing, zoning and site planning, housing management and effective administration.

Thirdly, the position of housing in the town and regional plan—whether it should be concentrated as at present, with consequent congestion, or whether it should consist of decentralised communities linked up with the main urban areas.



This is the policy being carried out in most countries overseas. It tends to link up rural and industrial housing, it provides encircling green belts, it fosters a family and community spirit, so essential for democracy.

To achieve success the most careful consideration must be given to the questions of site planning, road planning, recreational planning, and the distribution of educational and health units.

The solution of the housing problem, therefore, cannot be found in any single or simple formula. Panaceas, often advocated, tend to delay rather than expedite solution because they raise false hopes. The many specialists in the various phases of the work will contribute most by solving their own problems, in relation to the other specialists' fields. But they must not fall into the error as so often happens of blaming others, who are working on equally difficult problems, for their own failures to solve their own problems.

Since no single immediate or automatic solution of the housing problem can be anticipated, joint action on the part of Government and local authorities, industry and the community is required.

We must not shirk our National responsibilities. It is no use leaving such an important question in the hands of local authorities and housing boards where individual fancies or the whims of town councillors and public officials are allowed to dominate the question. A national policy should be adopted for rehousing the low income groups at acceptable minimum standards, as a co-operative undertaking among Union, Provincial and local governments and private enterprise.

This policy should be designed to stimulate local initiative, recognise local circumstances, and vest the control, save in exceptional cases, in the local authorities.

The Union and Provincial governments should extend, in

accordance with local needs, financial assistance to local authorities, conditioned on the existence of a comprehensive city plan and housing programme meeting satisfactory standards.

What is required is the appointment of a strong Committee of scientists and technicians, architects, civil engineers, and medical officers of health, to investigate the whole question of house planning, both economic and sub-economic, of economic methods of construction, of local building materials and the possibility of producing those which are at present imported, of land values, transport, and services in and around our urban areas, etc.

Research should be conducted in these various fields as soon as possible. By this method of procedure the State can be saved large sums of money which are not at present being utilised to the best advantage.

The home is the basis of social organisation: from it springs the street, the village, the town, the city, the region and the State.

We have, as I have said before, a great opportunity in this country, of avoiding the mistakes of the more congested countries overseas. National Planning alone can achieve this. Let us hope that this may be achieved.

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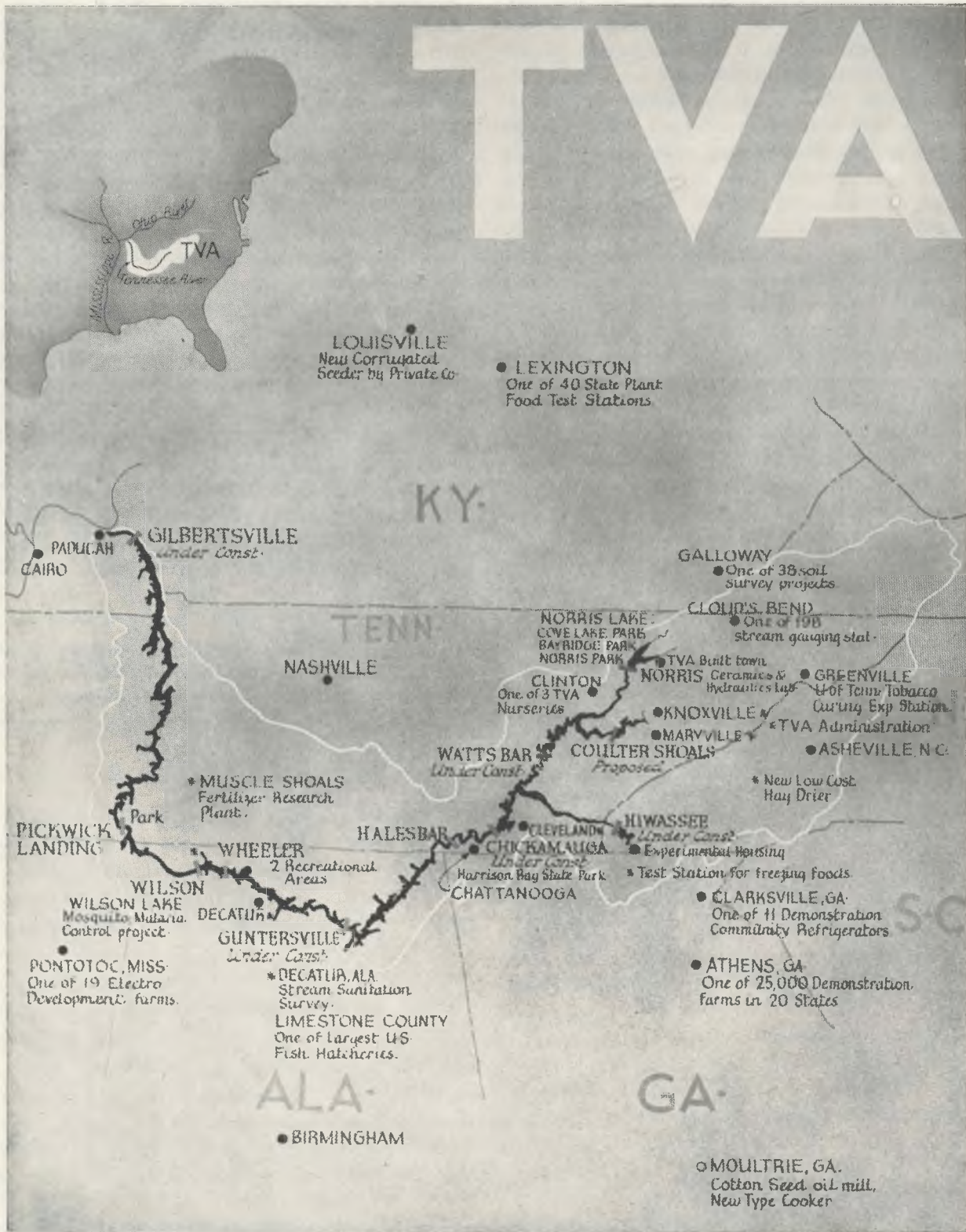
This paper was illustrated by lantern slides, illustrating particularly the T.V.A. scheme and Greenbelt towns in the U.S.A., both of which are dealt with in this issue.

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# TVA





# THE TENNESSEE VALLEY AUTHORITY AN EXPERIMENT IN REGIONAL PLANNING

by M. L. Bryer, B.Arch. (Rand), B. Litt. (Oxon), A.R.I.B.A.

A paper read to the Architectural Students' Society, University of the Witwatersrand, October 1st, 1942

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My purpose this evening is to discuss the Tennessee Valley Authority, an experiment in Regional Planning. It must not be supposed that what I am going to say to you constitutes the full story of this experiment. Relatively speaking, it is still in an early stage of development, and even of the development that has taken place since the Tennessee Valley Authority's inception in 1933, I cannot give you a full account. In order to do so continuous observation of the experiment would have been necessary; and I have had no more than the opportunity to study it during the years 1938 and 1939. No more will be attempted than to describe in outline:—

(1) How and why the Tennessee Valley Authority came into being.

(2) What the Tennessee Valley Authority does, and how it does it.

(3) The social and economic effects of the Tennessee Valley Development.

Finally I shall attempt to indicate a few of the lessons of the Tennessee Valley Authority experiment which, in my opinion, are of vital importance to the future social and economic development of South Africa.

We are in a state of national emergency and shall continue to be so, long after the war. It is clear that we cannot carry on our economic life in the old way, and that we shall have to make drastic economic changes. Already the war has forced on us the necessity for economic planning. We have taken various measures to overcome our difficulties. These measures may have some appearance of planning, but in reality they are no more than makeshifts and stopgaps. We have still to raise them from this position and integrate them into a unified system, a long range plan. Unless we do so as soon as possible, we may win the war, but we shall lose it in the long run, as we did the last.

Our immediate problem, apart from bringing the war to a successful conclusion as quickly as possible, is to find a way to use our productive resources in order to raise the standard

of life of all our people, black and white. Immediately the war ends we shall have to provide work for thousands of our soldiers, and what is more, we shall have to prevent masses of unemployed from being thrown on to our streets.

This our Government has realised. With characteristic foresight, General Smuts has recently appointed a Social and Economic Advisory and Planning Council under the leadership of Dr. J. H. van Eck, to investigate the effects of our social and economic measures, and with this knowledge, to direct our national development. Some of us, and I should like to mention particularly Professor Pearse, our foremost authority on large-scale planning in this country, are keenly aware of the enormous problems that confront this Planning Council. As architects and citizens we have resented the inefficiency, the frustration, and the diversion of South Africa's planning efforts to base ends. We believe that within our economic system, based as it is on private enterprise, there is wide scope for continually improving the standard of life of all our people. Indeed those of us who would eliminate war and the causes of war by building a socialist system of life in which production is carried on for use not for profit, and in which the means of production are socially owned as well as socially worked, can make the greatest contribution to this cause by turning to account every opportunity to create a better social and economic order under the existing capitalist conditions.

Right now, our most pressing task, as I have said, is to prepare for the homecoming of our soldiers. We have to provide them with work and a decent livelihood, and safeguard our people against unemployment. It is of decisive importance, therefore, that we should all come to a clear and precise understanding as to how this immense and crucial task can be tackled, practically as well as theoretically. I have chosen the Tennessee Valley regional planning experiment for discussion in the hope that my remarks will contribute to such an understanding.

## HOW AND WHY THE TENNESSEE VALLEY AUTHORITY CAME INTO BEING

Let us now see how and why the Tennessee Valley Authority came into being. In order to do so we shall have to consider the major economic circumstances in the United States which gave rise to it. What were these circumstances? Briefly we may outline them as follows :—

The United States emerged from the World War I as a creditor country second only to Britain. Financially and technically she was equipped to play the leading rôle in the post-war reconstruction. Fourteen years later her economic system collapsed, and she was forced to undertake a fundamental reconstruction now commonly known as President Roosevelt's "New Deal." These years preceding the New Deal fall naturally into three periods. The first, from 1919 to 1921, in which an inflationary boom was followed by an industrial depression. The second, from 1922 to 1929, in which there was a sustained expansion of production and wealth such that the period was called the "New Era" of prosperity. And lastly, the third, from 1929 to 1933, in which economic stagnation set in, leading finally to complete collapse.

The chief underlying causes which accompanied the expansion and the collapse were :—

(1) The extraordinary development of industrial technique. Despite the fact that the growth of population had decreased due to natural causes and the restriction of immigration, the rate of industrial expansion was not high enough to avoid technological unemployment. So that already, before the period of stagnation, there was an unemployment problem in America comparable in severity to that of Britain in 1929.

(2) The fact that instability of employment and income was not compensated for by large wage increases. Particularly in the South, which includes the Tennessee Valley region, low-paid Negro labour and the economic backwardness of the poor whites reduced standards to such an extent that they were lower than in many European countries, particularly in respect of conditions of labour. On the other hand, the American middle classes, and the owners of the means of production either in the form of stocks or corporate property were able to get the full benefit of the industrial and business expansion. This was the main unbalancing factor in the United States' expanding economic structure.

(3) The rise of Big Business and monopoly practices especially in the price system. Added to this was a tariff policy which tended to decrease the volume of export of raw materials and agricultural produce, and accelerated the decline of agriculture which had actually started before the war.

(4) The concentration in production on capital and durable goods rather than on consumable goods. This was inevitable in view of the growth of wealth, and made for less stability of the economic system. When it began to stagnate in 1929, the production of non-durable, durable, and capital goods had increased by 23, 59, and 70 per cent. respectively. The relatively small increase in the production of non-durable consumable goods was largely due to the fact that wage-standards failed to advance; while the large increase in the production of durable goods, such as houses and cars, is evidence of the prosperity of the wealthier classes. The still greater increase in the production of capital goods, that is, instruments for further production, is explained by the facility with which new issues of stock could be made, the accumulation of funds for investment, and the large amounts which corporations used for extending plant and building up reserves. Thus we may say that the chief cause of instability was the maldistribution of income between economic classes.

(5) The weakening of Government regulation in many fields where previously Government had protected public rights against business monopoly. The public services such as Railways and Public Utilities, mainly electric power undertakings, provide the classic example of business monopoly's successful fight against Government regulation. By 1929 most of the electric power distributed to the American consumers was controlled by a few financial groups. One of President Roosevelt's stiffest tasks on taking office, in 1933, was to break the so-called "power trust," and it was in the Tennessee Valley region that he was to meet the most strenuous opposition.

(6) Financial excesses and stock-market speculation due to unsound developments in banking technique and in the organisation of the investment and security market; above all, to the inflation of credit in general. By 1929, capital equipment had been increased to such an extent that the prospects of profit declined, and it became more and more difficult to sell the products of the factories. The stock-market crash in that year was merely the beginning of the industrial stagnation, falling profits, and rising unemployment which ended finally in nation-wide strikes on the farms and riots in the cities by destitute men ready for a social revolution.

Such were the economic circumstances that preceded President Roosevelt's New Deal. For the sake of brevity I shall not deal with the social aspect of the situation. Its importance was duly recognised by the American people only when the effort of reconstruction was undertaken, for not till then did the shortcomings of their political and administrative machinery come to be fully realised. This at least was certain, that in the United States of 1933 no durable solution of her



**DUCKTOWN COPPER MINING AREA**  
at the corner of North Carolina, Tennessee  
and Georgia. Fumes from smelting killed  
vegetation in an area of 50 square miles,  
the run off of storm water did the rest.



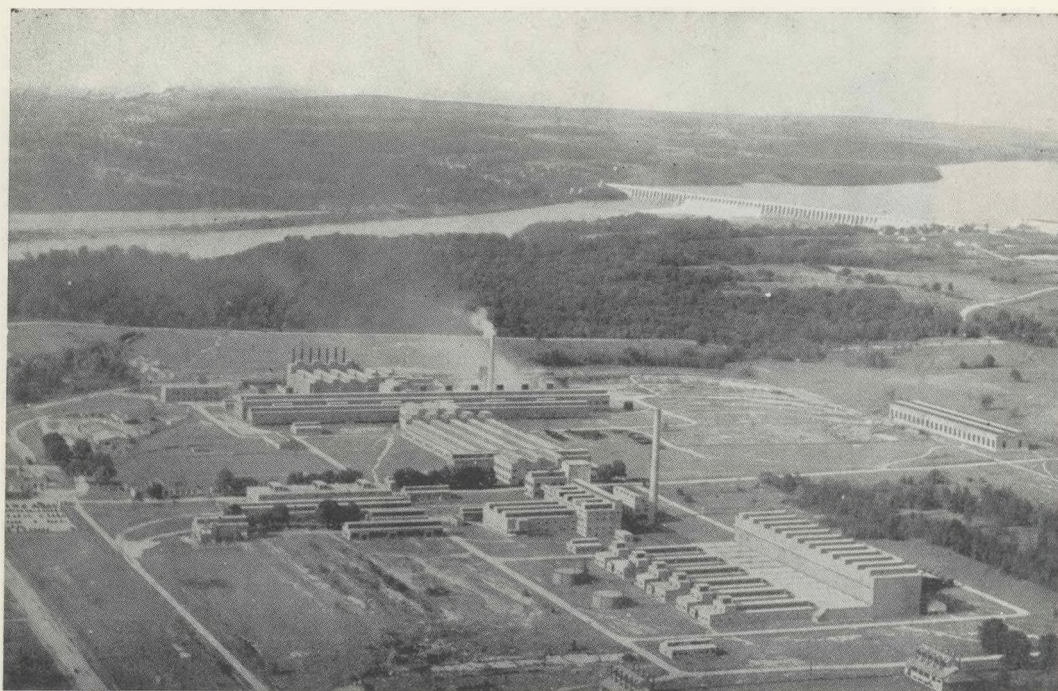
**POOR SOIL—POOR HOMES**  
A splendid home when the soil was fertile,  
now scarred and eroded it cannot pro-  
vide the amenities and advantages of  
modern life.



**PASTURES SAVE THE SOIL**  
A demonstration of the conservation of  
soil by planting to permanent pastures.  
Photo: U.S. Agricultural Extension Service.







WILSON DAM AND NITRATE PLANT—Erected 1917-1918. These works remained derelict until the creation of T.V.A. and are now maintained and used for developing new equipment and methods for manufacturing phosphate plant foods.

economic problems was possible without a drastic change in her social policy.

Faced with depression and unemployment on an unprecedented scale how was President Roosevelt's Government to revive the collapsed economy of the United States short of abolishing the capitalist basis on which it rested? The most obvious and expedient thing for any government to do in such circumstances is for that government itself to put men to work; and that precisely is what President Roosevelt's Government did do. One of the first of the many measures that were taken in the effort of reconstruction was to promote public enterprise, particularly public works.

It is at this point that the Tennessee Valley Authority comes into the American scene. On May 18th, 1933, exactly two and a half months after President Roosevelt's inauguration, the Tennessee Valley Authority was created by an Act of Congress for the purpose of reconstructing the shattered economic and social structure of the drainage area of the Tennessee River and its tributaries. The nucleus of this area was the vast hydro-electric plant at Muscle Shoals, Alabama, erected during 1917-1918 for the war-time production of

nitrites. It was not used and remained derelict until the creation of the Tennessee Valley Authority. In face of the opposition of the private interests which had gained control of the supply of electric power and had successfully withstood Government regulation, the Tennessee Valley Act was passed under the guise of the necessity for improved navigation on the rivers, flood control, reforestation, and national defence. The Act stressed these purposes rather than the social aims behind them, its architects knowing full well that the Supreme Court of the United States which guards the American Constitution, would hardly withhold from Congress the power to prepare for war, and that on this point even the American Respectability would not quibble.

Without going into the economic theory of how maximum social benefit can be derived from public enterprise in the capitalist economic system short of socialising the system, we must note that the Tennessee Valley Authority's strength as a measure for putting Americans to work, lay rather in its power "to provide for the general welfare of the citizens of said areas" than in its power to conserve and develop natural resources. For by directly serving the needs of the people it



could benefit a greater mass of the population than it could if it served less urgent and, therefore, less useful ends.

Here then, in very rough outline, is how and why the Tennessee Valley Authority came into being. You may feel that too much attention has been paid to the economic circumstances surrounding the creation of the Tennessee Valley Authority, but in my opinion, they are the key not only to the origin but also to the whole development of the Tennessee Valley Authority. They are the determining factors in the Tennessee Valley Authority's history both in respect of what it does and of how it does it. To these aspects we must now turn.

First of all, let us see what the Tennessee Valley was like when the Tennessee Valley Authority took charge of it in 1933.

We have a drainage area more than one third of the area of the Transvaal, or four-fifths the size of England. It includes the State of Tennessee and portions of six other States, is inhabited by two and a half million people, and about another three and a half million are within its sphere of influence. Most of these two and a half million people live on small farms, and in the south-western portion of the Valley, the Muscle Shoals country and the Scotsboro country, some twenty per cent. of the population are Negroes.

For nearly a hundred years the Valley lands had been recklessly exploited by melie and cotton planters intent on making profit. In the desperate drive for private gain, the big farmers drove the small ones into the barren hilly country, there to struggle and eventually rot with the soil. As land was abundant, these big planters moved from one field to the next leaving ruined lands in their wake. Vast tracts of planted and virgin forests were cut down in the process with the result that millions of tons of water were released to inundate and erode the abandoned fields. Nothing was put back into the soil and its wealth was carried away along the Mississippi down to the Gulf of Mexico. It has been estimated that in a hundred years erosion has destroyed one half of the good farm land of the Tennessee Valley. Spring floods literally tore up the bottomlands and drowned the towns. The flooding of the Tennessee River alone caused estimated annual damage to the value of one and three quarter million dollars or nearly half a million pounds, and the average loss at Chattanooga was about three quarters of a million dollars a year. The hillsides were dotted with derelict farms, and in the centres of industry stood the shells of abandoned plant. Beneath the soil, scarcely touched, lay thousands of millions of tons of coal and iron, limestone, and fat clays, bauxite, petroleum, copper, zinc, manganese, barytes, mica, olivine, kyanite, silky talc—in all not less than forty of the minerals most useful

to man. But despite this hidden wealth, the picture of the Tennessee Valley was one of ruin and desolation. It epitomised the failure of the financial system of the wealthiest nation in the world, but more than that, it was the irrefutable outward and visible sign of the collapse of an economic system which was inherently unsound.

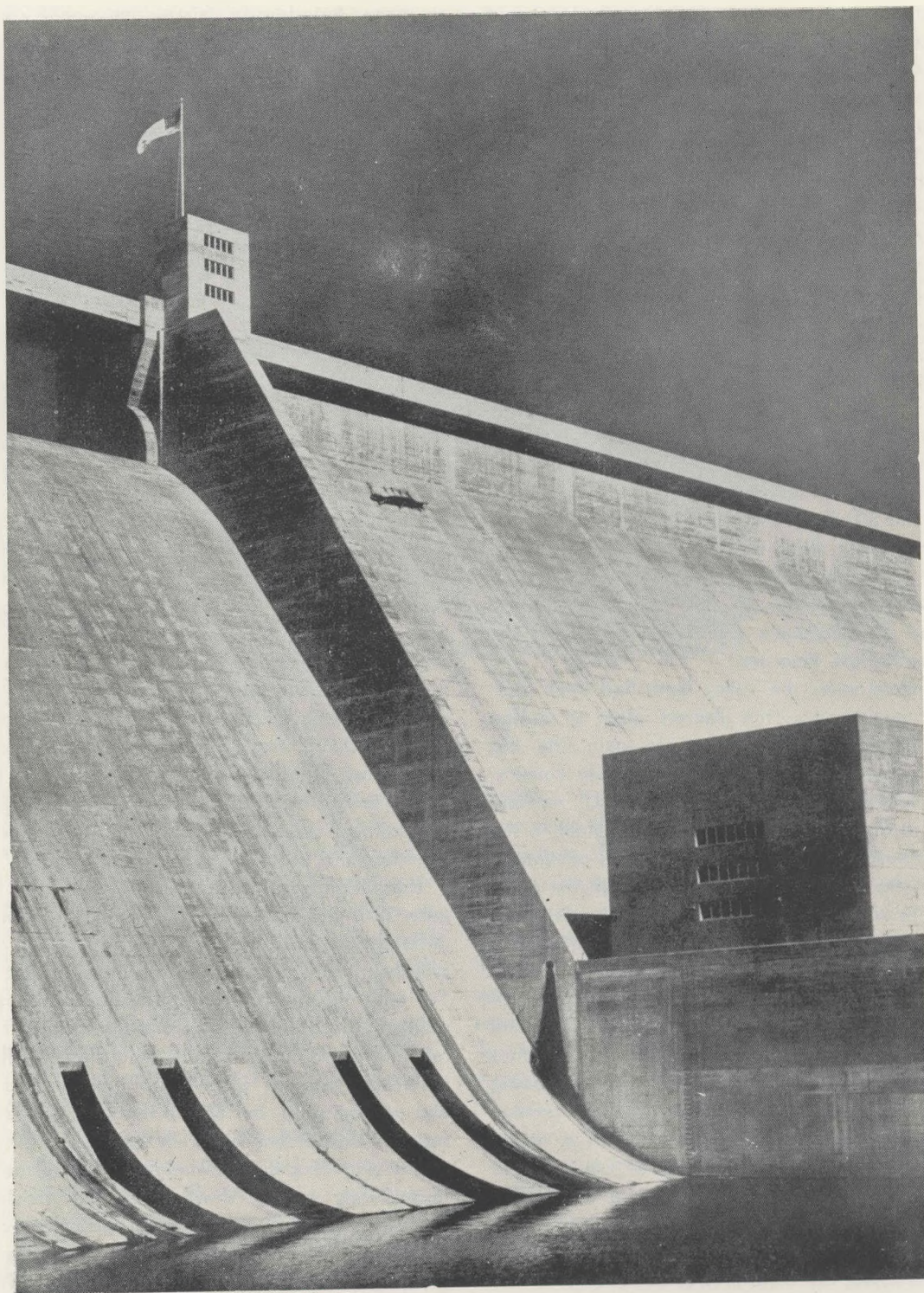
Now the Tennessee Valley Authority's primary job as laid down by Act of Congress, was to develop the Tennessee River system for navigation and flood control. The basic programme for this job had already been prepared by the United States Army who had long been interested in the Valley because of its potentialities for war purposes. In this connection it is interesting to note that during the last war eight of the nine locations recommended for munition plants in the United States were in this region. The system of navigation dams designed by the Army included the provision of electric power not only for operating the locks but also for the future development of munition plants. Thus when the Tennessee Valley Authority took over, the outline of its first task was already roughly defined.

Beyond this task, however, lay the infinitely more difficult one of providing "for the general welfare of citizens of said areas." It was easy enough with the aid of the Army to design and build dams and power houses, but to keep them working necessitated a multitude of other measures which directly and indirectly affected all the people of the Valley. For one thing, erosion had to be controlled to prevent the dams from silting up. For another, people had to have the means to buy electric power. The implications were enormous and nothing short of a unified, long range plan of the Valley's development could make progress possible.

The ultimate purpose of the Tennessee Valley Authority even if it did not express a popular movement, was clearly defined and fixed. It was "to foster an orderly and proper physical, economic, and social development of said areas." To fulfil this purpose the Tennessee Valley Authority was obliged to expand its programme into a comprehensive regional plan. This required the fullest possible knowledge of the Valley and its people, not only in terms of their past and present state, but also in terms of the possibilities of their future development culturally as well as physically. To the task of acquiring this knowledge the Tennessee Valley Authority immediately turned, drawing on the assistance of county, state, and federal agencies, and particularly of State colleges. As more and more facts were accumulated and assembled, so the regional plan gradually took shape. To-day, only nine years since its beginning, this plan is broadly and clearly defined.

To understand what the Tennessee Valley Authority's





NORRIS DAM—One of T.V.A.'s flood-storage dams situated on the Clinch River. This illustrates the unaffected and harmonious character of T.V.A. designs, and indicates a successful collaboration between architects and engineers.



regional plan involves let us take a look at it in actual operation.

## NAVIGATION AND RIVER CONTROL

First we come to the dams. By 1945 there are to be twenty-eight in all. Of these, nineteen are to be high flood-storage dams located on the Tennessee River's tributaries which run into it from the western slopes of the Great Smoky Mountains. These dams will impound the heavy rainfall of the highlands, and allow water to flow through their turbines in accordance with the requirements of the more powerful generating units on the main stream below. There, nine great power dams will use the water of the Tennessee River as it drops in steps down the Valley. Between its beginning three miles above Knoxville and its end at Paducah—a distance of 640 miles, the total drop of the river is 500 feet and its capacity to make electric power depends on the storage of the seasonal rains of the Southern Appalachians. To increase the number of generators in the main stream power dams, additional storage dams have first to be built on the head-streams above the river.

By means of locks the entire length of the river is to be navigable—the minimum depth of the channel is to be nine feet. Already the Norris Dam which stores water on the Clinch River for most of the year has reduced flood damage in the Valley by half, and, it has been reckoned, will pay for itself in seventy years out of flood salvage alone.

## POWER

The by-product of this vast system of flood control is giant power, and it is probably in this sphere that the Tennessee Valley Authority's work has the widest significance. Its policy is to provide "more effective protection of the public interest by the setting up of a measure of public operation of power as a 'yard-stick'; the second objective of this new national policy is to greatly increase the use of electricity in the homes, the farms, and the factories of the United States—in fact an electrified America." To achieve these objects the Tennessee Valley Authority is trying to find out exactly how much it costs to produce electricity, and to evolve a standard for the measurement of electrical charges, which can be used as a brake on the profiteering of private public utility companies. At the same time it is electrifying the homes, farms, and factories in its area by providing cheap rates, and by financing the purchase of electrical appliances through the

Electric Home and Farm Authority. This Electric Home and Farm Authority designs appliances suited to the area and to the type of house to be built in it, and also arranges for their purchase by the Tennessee Valley Authority's customers on an instalment basis. This is how the use of electricity in the Valley is being expanded.

The Tennessee Valley Authority's power resources, when fully developed, will be capable of serving about one-third of the population of the United States—over one-third is within four hundred miles of Muscle Shoals. It is important to notice, however, that under Government ownership, power is not intended to follow population as it has done under private ownership. On the contrary the United States Government is endeavouring to reverse that relation and make population follow power. We cannot here discuss the economic feasibility and the social desirability of this policy except to remark that its shaping has been and is being greatly influenced by the Tennessee Valley regional planning experiment.

## LAND USE

The ramifications of the Tennessee Valley Authority's engineering work reach far beyond the Valley region and make it necessary to relate the region to the surrounding country. Take for example the item of transportation—water, rail, road, and air, which links the Valley to such traffic hubs as Atlanta, Birmingham, Memphis, and Cincinnati. The Tennessee Valley Authority's job in this sphere is to work out an integrated system that will most efficiently serve all the Valley requirements, both freight and passenger, using every type of transportation as economically as possible.

This job is merely a small part of the more complex and difficult one of using the land of the region to the maximum advantage of all its people. The Tennessee Valley Authority believes that "the basis of human economy" is land-use planning, and is zoning the region at the same tempo as its knowledge of the Valley and people accumulates. Its use of the land depends on such questions as (1) What farm land shall be turned into forest, or taken out of plough crops and put into pasture? (2) What land in forest tracts shall be set aside for farming? (3) Where shall roads run and how will they relate to rivers, railways, and reservoirs? (4) If a dam is built in a certain locality, will valuable mineral deposits be drowned out of use? (5) Where, in relation to such mineral resources, to the land, and to transportation facilities, should factories be located? To answer these questions requires exhaustive information; without it no zoning and planning is possible.

## FORESTRY

To control flood erosion and erosion due to the uncontrolled cutting of forests and to the planting of unsuitable crops, the Tennessee Valley Authority is carrying out a vast programme of reforestation, most of it on non-agricultural lands. In addition, it is building up forests as a timber resource of the Valley, by developing nurseries and studying plantations already made. Of the seventeen million acres of forest land in the Valley, five million were already in Government ownership when the Tennessee Valley Authority started work. Most of the five million are in national parks, and all but three and a half million of the balance have now been bought for the nation. In carrying out this work the Tennessee Valley Authority collaborates with various Government agencies, such as the U.S. Forest Service, the seven State Forest Services, the State Game Commissions, the U.S. Bureau of Fisheries, and the U.S. Biological Survey. Fisheries, wild fowl, and game, are developed, but more important from the social standpoint is the development of public relations.

The general policy of the Tennessee Valley Authority in forestry is that the management of the small farm woodlands will continue under private ownership and regulation, but that the large forest tracts must and will be publicly owned and operated in order to ensure not only adequate development of the Valley's timber resources but also the permanent protection of its water sheds, navigation, power dams, and flood control.

The control of erosion does not stop at forestry. Other methods are being used, notably the building of check dams and drainage channels, and the planting of grass. The Tennessee Valley Authority is trying out every kind of cover. Bermuda grass behind the dams, bush clover or lespedeza where sheet erosion takes place, and even honeysuckle which everyone in Tennessee despises. Three million trees each of black walnut, tulip poplar, oak, pine, and the blight resistant asiatic chestnut have already been planted in the Tennessee Valley Authority's nurseries. All of this work has been done by the Civilian Conservation Corps, an organisation set up by President Roosevelt at the beginning of the New Deal, to provide useful work for the unemployed youth of the nation.

## AGRICULTURE

The Tennessee Valley Authority's work in developing agriculture is perhaps the most arduous of all its tasks. The Valley contains some of the finest stock of people in the United States—almost all native American, for the percentage of

foreign-born whites in Tennessee is not more than .7, but the last hundred years, as we have seen, has brought a progressive decline in their condition. The small hillside farmers tucked away in narrow isolated valleys live in a state of the most abject poverty. Here the soil has wasted away and game has become less plentiful. The farmer suffers from poverty and illiteracy. In 1933 it was found that in a mountain county the average annual cash income per family was £9, of which £2 was relief money, and that a family of father, mother, and six children who received £20 in cash in the year were doing well. The Tennessee Valley Authority's job in agriculture, therefore, is to rehabilitate land and people wrecked by uncontrolled individualism. It is attempting to do it by introducing more diversified farming and specifically, by introducing sod crops to replace the single cash crop of cotton, thereby making the farmer more self-supporting. For this purpose phosphate fertilisers are required, and these are being produced at Muscle Shoals. The source of phosphate in the Valley, as in Florida and a few of the western states, is the graveyard of prehistoric animals whose fossilised bones in the course of time have been changed into beds of phosphate. For the time being the fertilisers are being used at Agricultural Experiment Stations and on two thousand demonstration farms throughout the Valley, where experiments are being carried out and methods of farming studied and taught.

One of the first jobs tackled by the Tennessee Valley Authority was terracing of the land. In this it is assisted by state agricultural agencies and land-grant colleges which co-operate with the farmers who have themselves formed co-operatives. The better to regulate the flow of the rivers, the Tennessee Valley Authority is concentrating its immediate attention on the farm counties near them.

## INDUSTRY

As we have noted, the Valley is rich in mineral resources, so rich that it has been called the "American Ruhr." The key to its situation when the Tennessee Valley Authority took charge was that these mineral resources had been largely undeveloped, while the soil and timber had been wasted. The Tennessee Valley Authority is, therefore, trying to establish a balance between the Valley's agriculture and industry. It is not fostering the further development of large-scale industries partly because it wishes to avoid entering into competition with existing industrial centres. Development is desired rather along the lines of small-scale local industries such as dairying, canning, high grade furniture making, printing, or the manufacture of optical instruments, all of which will develop local and specialised skill. By means of the



Tennessee Valley Authority Co-operatives Incorporated, the Tennessee Valley Authority is trying to organise upon a co-operative basis the marketing and interchange of agricultural and industrial products. The Co-operatives are helping to bring about a healthy diet for the rural population who have long suffered from malnutrition.

Under the existing economic system, all that the Tennessee Valley Authority can hope to do with regard to the development of large-scale industries is to provide a programme that combines the best interests of the Valley and its people and the best interests of the industrialists themselves. It aims to sell the cheapest electric power in the country, and although the cost of power is counted as a relatively small part of the total value of heavy industries, the Tennessee Valley Authority will be in a very favourable position if electro-chemical and electro-metallurgical industries are started in the Valley. For the relative cost of power in these two fields is well over 10 per cent.

It may be, as the Tennessee Valley Authority believes, that the Valley will witness an expansion of industry during the next decade which will change the economic life of the South. But such expansion, whatever economic motive force is behind it, is not likely to take place physically as it has done in the past. Because the chief forces that have caused the concentration of industry in the past—the necessity for coal, the need to settle along arterial railways, and the lack of transportation for workers, are being replaced by forces of decentralisation—cheap electric power, lower operating costs, more efficient distribution and management, greater flexibility of small organisations, better balance between farm and factory, and greater possibilities of healthy living.

The location of many of the Valley's mineral resources would seem to be another factor in favour of decentralisation, and the possibilities of using them industrially by means of cheap electric power are more than inviting. The Tennessee Valley Authority's electric power has made and is making possible the industrial production of numerous chemical compounds, ferro-alloys, aluminium, electrolytic zinc, cement, bricks, tiles, porcelains, chinaware, paint, insulation and refractory materials.

## COMMUNITIES

In many cases the construction of the great dams and power houses, some of which have taken three to six years to build, necessitated the provision of living quarters for the workers on the job. The number of workers on a dam has varied roughly from fifteen hundred to five thousand. To accom-

modate them villages have been laid out and built, notably at Pickwick, Wheeler, and Norris, where the Tennessee Valley Authority has carried out experiments in town-planning. The policy has been to lay out these villages on the principles of the English garden city as propounded by Ebenezer Howard. The area of the town is divided into three concentrically circular zones, the innermost for housing, the outermost for recreation parks, and the intermediate one for gardening. Norris, for example, is so designed as to expand in due course to a maximum population of ten thousand, the garden land providing a half acre to four acres per family. This town stands on a well wooded, fairly level site and consists of various types of housing for families and single workers, a shopping and community centre, a school, garages, and small industrial buildings.

The housing is divided into four general groups: (1) A hundred and fifty one brick and wood frame houses whose average cost including utilities (taking five dollars to the pound) was £1,236, and average rent a little over £6 per month. (2) Eighty cinder block houses. The average cost of a four-roomed, one-storey cottage of this type was £378, and the rent nearly £3 per month. (3) Sixty cinder block, frame, or stone houses, each of four rooms, one fireplace and bath, and sometimes a rear porch. An average house in this group cost £415 to build, the rent being slightly less than £4 10s. 0d. per month. There are also two-family houses which rent at about £2 10s. 0d. a family a month, five cinder block two-storey (apartment) houses, and one experimental steel house. (4) Eight wood frame and shingle bunk-houses for the single workers, in a camp on the edge of the town.

The whole town including land, buildings, streets, water supply, sewage disposal, and electric service, cost the Tennessee Valley Authority £700,000 of which about one-third went into the camp. The camp buildings are permanent structures and may be used for industrial purposes. Elsewhere, as at Hiwassee the workers' dwellings were temporary structures of wood framing and insulation board, designed to last four years. Structures of this nature are sometimes moved to new construction sites or let to holiday makers, the Tennessee Valley Authority's policy being to derive the greatest possible use from these buildings.

The architecture of the houses is supposed to be in keeping with that indigenous to the Valley, and due consideration has been given to workability and comfort. Water-proofing, termite-proofing, heat insulation, and ventilation have been adequately provided, but in appearance and layout the standard of the housing falls far short of that of the dams, power-houses, and control works, and the same may be said



of all the buildings in the Tennessee Valley Authority's new towns.

Norris's layout appears to have been evolved predominantly from existing clearings in the woodland on which it stands. The roads follow the clearings and the houses line the roads, making a loose town structure which is held together by the woods. The only formality in the town plan occurs at one end in the arrangement of the shopping and community centre and the school; and at the other end in the complex of camp buildings. As the future population of Norris is not to exceed ten thousand, the informal, semi-rural character of its layout is to some extent justified. Personally I would like to have seen a layout more in the nature and spirit of Le Corbusier's "Ville Radieuse," for which there are many precedents in the history of American town planning, and which would be more indigenous to the Valley now that its dams, power plants and pylons have changed both its external and internal character. Norris rather depressed me because it was suburban and dull.

To-day Norris is inhabited by a small force of Tennessee Valley Authority employees whose job is to maintain the dam and protect the reservoir, and by people in various trades. It is hoped to develop small local industries and crafts, and already a start has been made in ceramics and porcelain. The rents at Norris give a gross return of seven per cent. on the cost of the town excluding the camp. The taxes and cost of administration, it is hoped, will largely be covered by land leases for business and industrial enterprise.



**THE RECEPTION AND DISPLAY ROOM AT WHEELER**  
An example of a typical educational exhibit in the administration and service buildings throughout the Valley, telling the story of T.V.A.'s achievements and aims.

## EDUCATION

Realising that the success of its undertakings depends ultimately on the understanding and co-operation of the people it serves, the Tennessee Valley Authority has developed a programme of education using every possible means to spread it throughout the Valley. Generations of poverty among large sections of the population, and the inertia and apathy born of poverty, make this a very difficult task. The process is slow. But already a great deal has been accomplished. The policy is to help the people to help themselves. Most of the training that the Tennessee Valley Authority offers them is, therefore, vocational and technical, and is important to the development of the Valley. This training is given to children and adults alike in co-operation with the existing schools and State universities, and of course, through Tennessee Valley Authority's workshops. The Valley is being equipped with libraries, and among the workers, University-trained men and women, foremen, and engineers, voluntarily teach their illiterate fellows during leisure hours. The Tennessee Valley Authority's use of display as a method of education merits special praise. Photographs, diagrams, and charts attractively arranged on the walls in the Tennessee Valley Authority's administration and service buildings throughout the Valley tell an exciting story of its achievements and aims—and of the possibilities of future well-being for all American citizens.

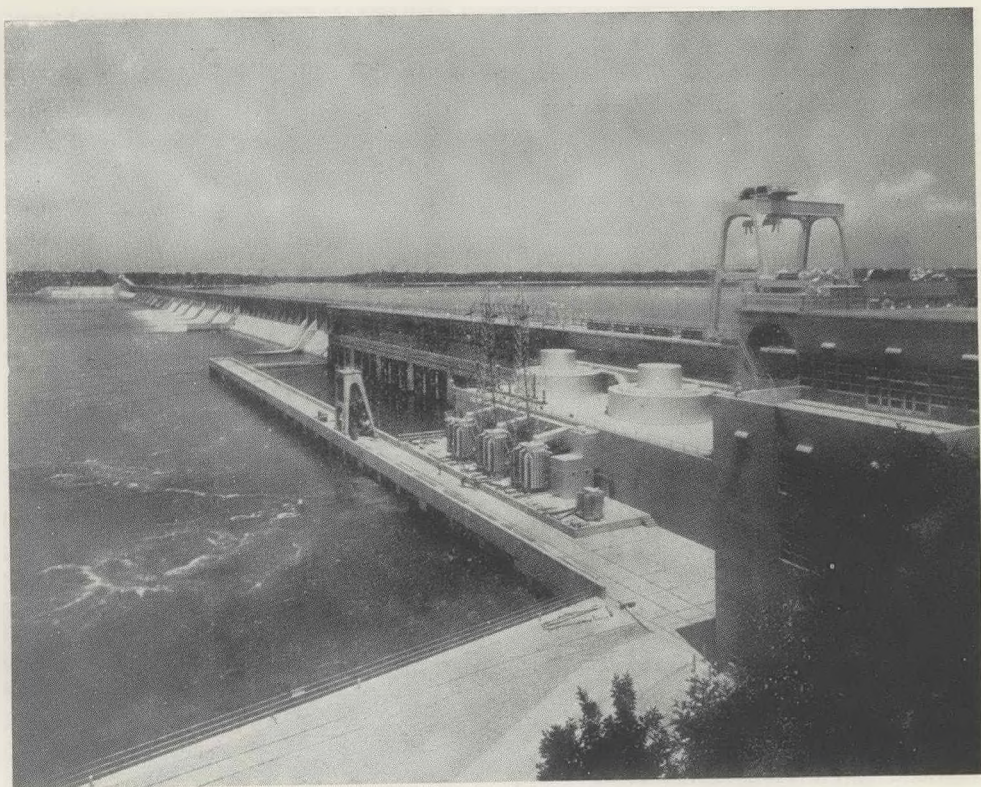
## RECREATION

Less spectacular than the dams themselves, but equal in terms of planning and design, are the recreation areas which the Tennessee Valley Authority has developed in conjunction with the reservoirs. These areas lie on the borders of lakes which are part of the reservoirs. They contain parks with facilities for parking, boating, bathing, picnicing, camping, riding, and refreshment. So attractive are these areas that before the War nearly two million people visited them every year. The Valley has derived a considerable income from tourists because it has catered for them well.

## LABOUR

Viewed as a large-scale laboratory experiment in training people how to live, the Tennessee Valley Authority may be considered as working under very favourable conditions. It has its own labour force of some 20,000 people who have been very carefully selected from a hundred thousand





WHEELER DAM—With the exception of the outdoor power-house, this dam is typical of the design of recent main river dams.

applicants according to standards set up by the Tennessee Valley Authority itself, entirely exclusive of political considerations. The key men and their assistants have been drawn from all parts of the United States and a large proportion of them are University trained. Generally, workmen have been selected on their ability to do the Tennessee Valley Authority's work and on their capacity to absorb the Tennessee Valley Authority's training, which is carried further afield as they disperse through the Valley. Thus the Tennessee Valley Authority hopes to spread its standards throughout the area, whose condition may improve as and if they do.

Two problems which the Tennessee Valley Authority is nowhere near solving and not likely to solve under the existing social-economic system are: (1) The Negro. (2) The sharecropper, the counterpart of our poor white farmer. This is not saying that the Tennessee Valley Authority has not attempted to face these problems. Down in Alabama, for

example, the Tennessee Valley Authority has hired Negroes to the extent that their employment percentage is equal to their population percentage—some 20 per cent. It has given them the same wages, living facilities and training as its white labour—the training through University trained Negroes themselves. The old national policy of segregation is followed, and is accepted by one group of Negroes led by W. B. du Bois, who advocates the building up of an independent self-contained Negro community in the United States. Another group, however, under the leadership of A. L. Harris, is working to establish a community of interest between the white and coloured peoples based on the common experiences of the workers of both races, under the existing economic system. This policy is far more practicable especially in times of economic depression.

The Tennessee Valley Authority endeavours to overcome white labour's fear of Negro competition for employment by



treating its Negro labour on a par with its white. In reply to the opposition to this policy it has pointed out the irrefutable fact that the Negro is a member of the community and might rather be a decent than an indecent one.

Of the 230,000 farmers in the Valley, 95,000 are tenants who eke out a precarious existence mostly by planting cotton on the land they do not own. In buying up some of this land the Tennessee Valley Authority has succeeded in placing many of the sharecroppers elsewhere in the Valley, and has absorbed more of them in construction and maintenance work, but as yet it has only scratched the surface of the problem of the sharecropper, who is black as well as white.

## THE ORGANISATION OF THE TENNESSEE VALLEY AUTHORITY

Let us now look into the nature and structure of the Tennessee Valley Authority itself, for by doing so we may gain some idea of its weakness and strength as a means of raising the standard of life of the American people.

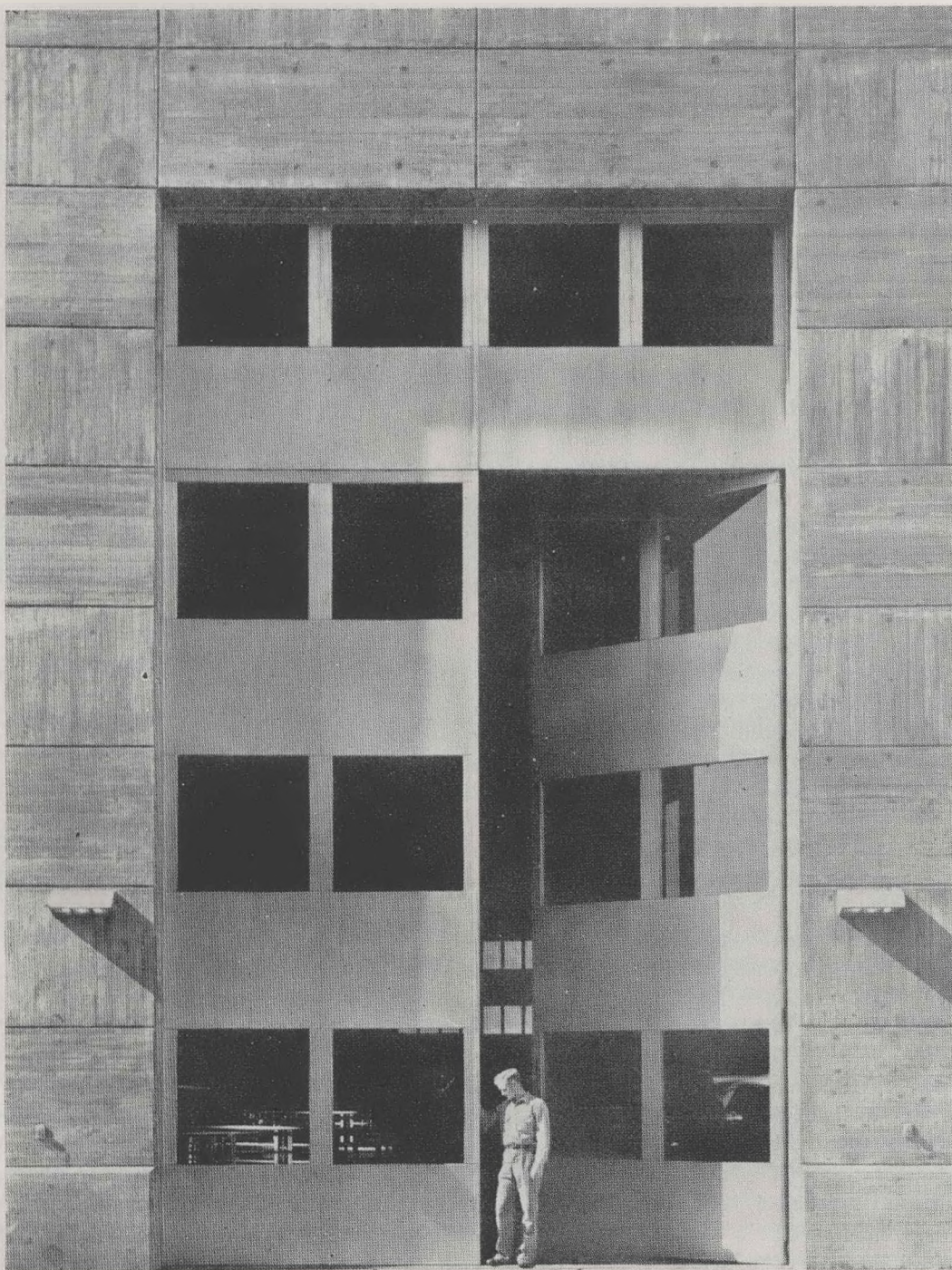
In the first place the Tennessee Valley Authority was conceived not as an emergency short-term undertaking in which speed of action was the determining factor, but as a permanent organisation developing a varied and long-term programme. It therefore differs from the other recovery organisations of the New Deal in that it does not come under any Government department. It is a corporation controlled by the Federal Government, and money is voted to it by Congress. It functions both as a planning and as an administrative body, and in this respect differs from most planning agencies in the United States in that they have no administrative function, but merely advise. Such an agency, for example, is the U.S. National Resources Committee (now the National Resources Planning Board), which was originally appointed by President Roosevelt, in 1933, to advise and assist the Federal Government in the preparation of a comprehensive programme of public works under the National Recovery Act. It is similar in many respects to our Social and Economic Advisory and Planning Council.

The Tennessee Valley Authority is headed by three Directors. At the time I was in the United States they were Dr. Arthur E. Morgan, an experienced hydraulic engineer, President of Antioch College, and chairman of the Board of Directors of the Tennessee Valley Authority; Dr. Harcourt A. Morgan, an agricultural expert and one time President of the University of Tennessee; and David E. Lilienthal, a utilities

expert from Wisconsin. These men formulate policy and make the major decisions. In doing so they are assisted by legal and fiscal advisers. The liaison between them and the whole administrative organisation is by way of a general manager who is responsible for the execution of the Director's policies and decisions, and the efficiency of the administration. Under the general manager the organisation consists of a number of departments each of which deals with one or more of the aspects of the work we have discussed. The technical and clerical staff numbers 4,000 men and women, and the Regional Planning Studies Department alone has a staff of 100 architects, highway planners, town planners, and regional planners under the very able directorship of Earle S. Draper. The headquarters of the organisation are five office buildings in Knoxville, Tennessee. From this point, the Regional Planning Studies Department surveys the region and its problems and plans the use of the land. The information it is compiling assists the Authority in its current administrative responsibilities and serves as the basis of legislative recommendations as stipulated in the Tennessee Valley Authority Act. Co-ordination of the regional planning studies and recommendations is furthered by a Regional Planning Council consisting of the heads of the regional survey, public health and safety, commerce, agricultural industries, and reservoir property management departments, together with the heads of the other planning departments as required by the nature of the problems involved. Considering the colossal scale of the Tennessee Valley Authority's task, the technical staff is not large. As we have seen, however, it is assisted by the staffs of other government agencies, local, state, and federal, with whom it co-operates. Of the federal agencies alone it co-operates with the Department of Agriculture, the Forest Service, the Civilian Conservation Corps, the Resettlement Administration (concerned with the problem of blighted areas), the Bureau of Fisheries, the Bureau of Mines, the Geological Survey, the Biological Survey (concerned with the protection of wild life), the War Department, and the Bureau of Reclamation (famous for its designs of the United States' greatest dams—Grand Coulee and Boulder).

For the financing of the Tennessee Valley Authority's programme, an initial fifty million dollars were allocated to it by Congress from Public Works Administration funds, and it was empowered to raise an equal sum in bonds at  $3\frac{1}{2}$  per cent. redeemable in fifty years. Some revenue is expected from the sale of electric power and fertilisers. It has been estimated that the total outlay on the completed system of dams will be about 370 million dollars, or, as Stuart Chase has computed it, "the cost of a half dozen battleships."





These massive aluminium sheathed doors of the Norris Power-house were designed to permit the passage of heavy equipment. They combine elegance with an ordered and practical economy, and relate well to the board-textured concrete walling.



## THE SOCIAL AND ECONOMIC EFFECTS OF THE TENNESSEE VALLEY AUTHORITY DEVELOPMENT

Let us now briefly consider some of the social and economic effects of the Tennessee Valley Development as far as they can be discerned at the present stage.

There is no doubt that the Tennessee Valley Authority has made a considerable contribution to the prestige of public administration. By no means socialistic in practice or intent, it has nevertheless proved the possibilities of co-operation between people and government even under a social and economic system which rests on private enterprise. It has reduced waste of public funds and has been a positive progressive force in the United States in as much as the people who suffer most from economic depression and social injustice have participated in its work and benefits. Participation by these people has been encouraged as far and as widely as possible, and they have benefitted considerably by the increased purchasing power, the education, and the training which the New Deal Government have given them through the Tennessee Valley Authority, although not so much as to be noticeably relieved of poverty and unemployment. Such relief, in my opinion, necessitates far more drastic measures than the Tennessee Valley Authority and all the other New Deal activities represent, but we cannot discuss them here except to point out that given a progressive government under the existing economic system, the Tennessee Valley Authority has been and can be one of the effective means of achieving a higher standard of life for all the American people.

So far Big Business and Finance have fought unsuccessfully to exterminate the Tennessee Valley Authority. The public utility companies, in particular, resenting the Tennessee Valley Authority's invasion of their sphere in the distribution of electricity and its power to sell electricity, brought their case against it to the Supreme Court, confident of victory in the light of their interpretation of the American Constitution. But the colossal works of the Tennessee Valley Authority, the dams, the power houses, and the transmission lines, if not the people themselves, had to be protected from the onslaughts and intentions of a few but mighty vested interests. And in 1936, when the Supreme Court delivered judgment in favour of the Tennessee Valley Authority, the American people hailed the decision as their own victory, which undoubtedly it was.

In the scene of the United States at war, the Tennessee Valley Authority stands out as the greatest of the projects undertaken by the New Deal, without which, it is safe to say,

not only that country but also her Allies would have been in a precarious position to-day. To mention just one of its contributions to the war effort, the Tennessee Valley Authority supplies 60 per cent of the electric current required by the vitally important American aluminium industry. The significance of this fact is not that the United States has developed her vast productive resources in time to turn the tide of war, but that she has done so only by virtue of such large-scale, long-range planning as has been undertaken by the Tennessee Valley Authority.

As an experiment in planned economy, however, the Tennessee Valley Authority's inherent weakness lies in its own localisation. The New Deal Government intended it to develop methods of economic control which may be applied later to the United States as a whole. But the system of co-operative interchange of products which the Tennessee Valley Authority has been developing cannot but operate within fairly rigid local limits and cross over the old-established distributive channels which lead in and out of the big cities, and not in and out of the small rural settlements. It would seem, therefore, as one of the Tennessee Valley Authority's directors has hinted, that the Tennessee Valley Authority will have to try and break through the existing distributive channels to create a local economic system which in some respects will have to be complete in itself. The danger is that the protection necessary to the maintenance of such an economy may lead to economic regionalism of an extreme nature.

## LESSONS OF THE TENNESSEE VALLEY AUTHORITY FOR SOUTH AFRICA

We come finally to consider a few of the lessons of the Tennessee Valley Authority regional planning experiment which, I feel, are of great importance to the future social and economic development of South Africa.

The first is this: Given an economy such as the South African, which, relative to that of the Tennessee Valley, is based on extremely limited natural and human resources; to combat unemployment and stagnation, and raise the standard of life of the whole population to the highest possible degree in the shortest possible time under the existing social-economic system, certain indispensable measures must be taken which will ensure progress towards these objectives. At a bare minimum, these measures, in a country like South Africa, must include: (1) the undertaking of a comprehensive programme of public and semi-public enterprises for useful pacific purposes; (2) the encouragement of public and private enterprise and investment at a fixed level of profit by lowering the cost of money to all intending borrowers; (3) the redistribu-





The Roadway over the Wheeler Dam displays a marked economy of form and material—simple light standards and railings of standard steel shapes.

tion of incomes in favour of the wage-earning classes without thereby causing a rise in the costs of production; and (4) the expansion and improvement of social services.

All of these measures imply greater public control of the economy, and to some extent they already exist in South Africa. In this connection I would refer you to Dr. F. J. van Biljon's classic work on "State Interference in South Africa." But as the Tennessee Valley Authority has shown, the effectiveness of these measures depends essentially on careful co-ordination and planning; they have to be integrated and developed into a unified long-range programme. This, in fact, is the task of our Social and Economic Advisory and Planning Council, and, as I see it, the crucial questions before this Council are: How is the task to be tackled? By what means and methods can it best be undertaken?

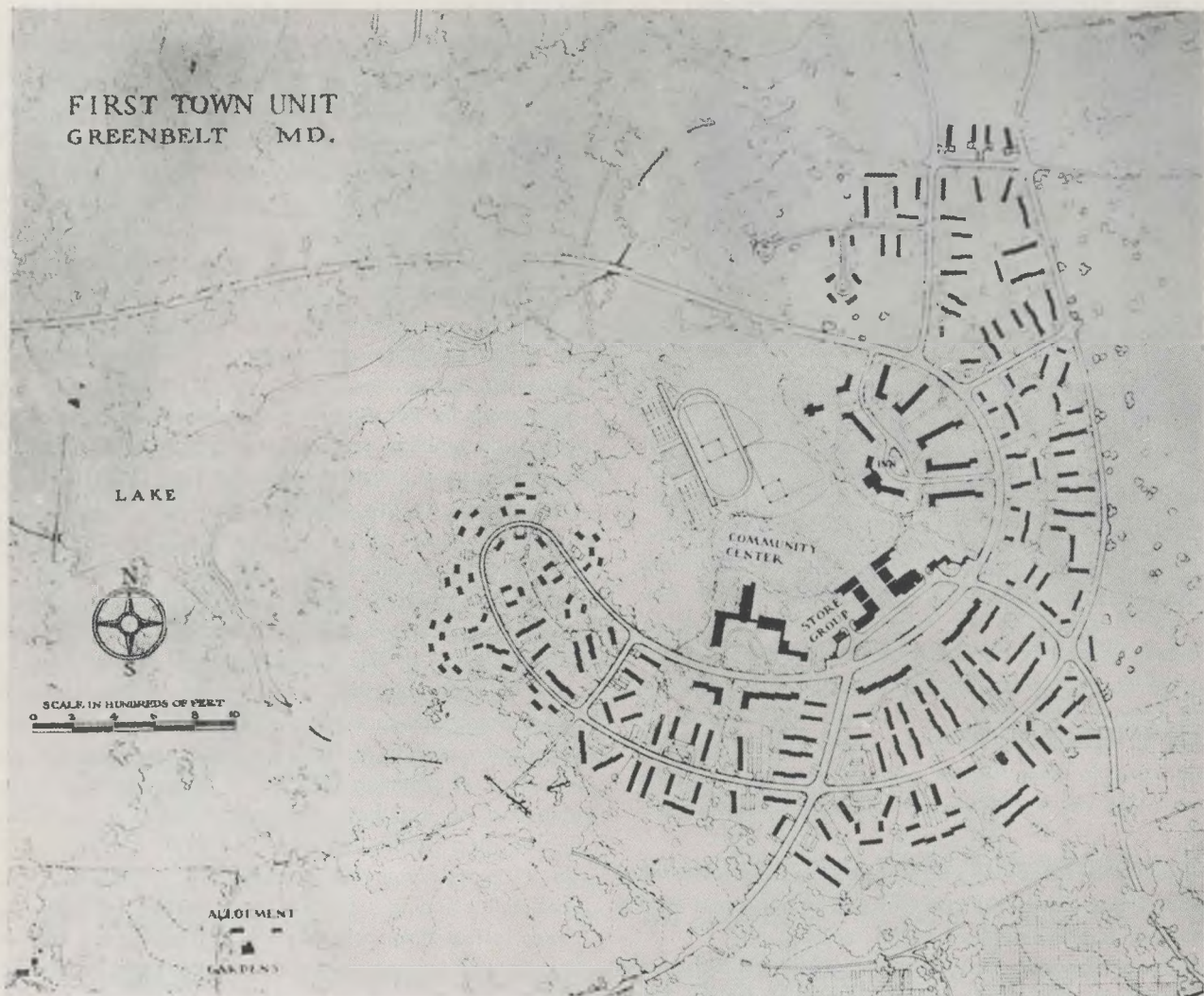
Here we come to the second lesson which the Tennessee Valley Authority offers us. It is, in a word, Regionalism. The concept of human development in terms of man's relation to geographic areas and the potentialities of further human

development which this relation represents. This is by no means a new idea, nor has it always been merely an idea. For during the past century in France, Germany and England, various movements have taken place for the reconstruction of social and economic life along regional lines, and have produced a scientific background for this purpose. Among capitalist countries, however, the United States has been the first and only one to put the idea into actual practice and attempt to carry it out as a new form of economy which may eventually become a new national economy. How she is doing so, by what means and methods, and what is involved, is all being demonstrated by the Tennessee Valley regional planning experiment. It is along such lines, I believe, as are suggested by this American experiment, namely, regional planning and building applied on a national scale, that our Social and Economic Advisory and Planning Council may well find the answers to the questions before it.

Thanks to the efforts of men like Dr. J. H. van der Bijl we are rapidly acquiring the industrial power and experience which is absolutely essential to the proper building of South Africa as an economically and socially healthy nation. The development of this power has itself required no little planning and organisation, and demands regional planning of at least the country's resource base. As we have seen from the Tennessee Valley Authority experiment, however, the consequences of planning the use of resources are numerous and far-reaching and have to be foreseen well in advance.

The rigid public control of our economic life to-day puts us in a very favourable position to undertake regional and national planning. But we must realise that this control has been established primarily, if not solely, for the destructive purpose of waging war, and that if we are to win the war and the peace, this control must be maintained and extended at all costs, as an instrument for giving useful employment to all our people, and continuously raising their standard of life; in short, for the creative purpose of building a better South Africa. This purpose, the War if nothing else has proved to us, is capable of fulfilment by Government alone, and we must therefore see to it that we have only such government as will prosecute it with the utmost vigour and efficiency. For in the last analysis the success of the Tennessee Valley Authority, as of all similar undertakings, depends on socially and economically progressive forces being and remaining in power. This is the last but not the least of the lessons of the Tennessee Valley Authority on which we can and must now act in order to secure a better and fuller life for ourselves and for the generations of South Africans as yet unborn.





THE TOWN OF GREENBELT SITUATED CLOSE TO WASHINGTON, D.C.

The road system economically designed to follow the ridge contour, defines the large residential blocks which encircle the community and shopping centres. The recreational area is conveniently located in this layout, while allotment gardens are arranged on the outskirts, with small farms beyond, serving the community.



# A REPORT ON THE GREENBELT TOWNS IN THE UNITED STATES OF AMERICA

by R. Kantorowich, B.Arch. (Rand)

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Of all the aspects of American life that were rudely disrupted by the economic crash of 1929, and the succeeding years of slump, the housing situation showed itself in shortage and inadequacy in the most visibly striking terms. People suddenly became housing conscious. The lamentable failure of the building industry to provide adequate homes for over 60 per cent. of the people at prices they could afford to pay seemed to project the problem onto the hands of the Government as the only agency that might be able to cope with the situation.

In the course of the many and various attempts of the New Deal Administration to rehabilitate the stricken economic life of the country, the housing problem naturally received a great amount of attention. Many Government agencies took a hand in trying to clarify, alleviate, and perhaps solve the housing muddle. Of these the now no longer existing Resettlement Administration entered the housing field through its Suburban Resettlement Administration. Its purpose was to "put houses and land and people together in such a way that the props under our economic and social structure" would be "permanently strengthened."

The results of these ventures are the three Greenbelt communities which are perhaps the most significant contributions yet made by the United States in the Housing and Planning fields.<sup>1</sup>

The author has had the opportunity of visiting all three of the projects, and this report will attempt to combine a recounting of the background with some personal reactions and evaluations.

In 1935, the Resettlement Administration started to build the three Greenbelt towns. The Government's specific purpose was fourfold, and was to provide:

1. Constructive work for unemployed men and capital in the building industry and related fields ;
2. Housing accommodations for moderate income families, to relieve shortage in selected metropolitan areas ;
3. Demonstrations in modern town planning and the social and economical benefits to be derived therefrom ;
4. Experimental areas for development of integrated urban-rural relationships."

The basic programme was expressed in September, 1936, as follows :

"To obtain a large tract of land, and thus to avoid the complications due to diverse ownership ; in this tract to create a community, protected by the encircling green belt ; the community to be designed primarily for families of moderate 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 or untested discipline ; the dwellings and the land on 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 in that region ; coordination 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 income will not be a necessity, and that 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 coordinated 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."

It seems that the Resettlement Administration anticipated a large scale building boom (which incidentally has not materialised) and sought to prevent in advance, by a sound demonstration of modern planning, a recurrence of the disastrous results that all previous building expansions had had upon the American city. In the past, each new wave of building activity brought in its trail further and yet further choking up and disorganisation of the city ; districts were condemned to a future as slums before the painter had left the site. The lack of any effective demonstration of an alternative method of approach—a method of conscious planning—on the experiences of which the building industry might draw when it



started to build again, was as good a reason as any required for the carrying out of these projects.

A new idea is like a broad river ; it is, in its unity and individuality, the confluence of many previous streams of thought. The Greenbelt idea is no exception. The success of the garden cities of Letchworth and Welwyn, in England, and the demonstration by Henry Wright (father of American City Planning) at Radburn, New Jersey, of the super-block—these were the bases for the Greenbelt adaptation.

The big lessons that were learnt from these earlier demonstrations were :

1. That modern methods of transportation made it possible to live at a greater distance from the city and to take advantage of the healthy life of the countryside, and

2. That modern site planning made it possible to reduce the number of roads so that a stream of traffic would not pass by everyone's front door, and, as a consequence, a greater amount of green space could be retained for the effective use of the residents.

With these historical lessons learnt, a team of specialists was brought together. As was the case in practically all the New Deal ventures at that time, the Administration was able to commission the cream of the various professions required to carry out the work. This was an unique opportunity, and was directly due to the wide-spread depression and the complete lack of opportunities for the talents of these people in the field of private enterprise. Thus, each project commenced with a staff consisting of a general executive officer or coordinator, a city planner, an architect, and an engineering designer.

The first task was to select the sites for the demonstrations and for this, 100 American cities were examined. The requirements to be met by the chosen cities were that they had an increasing population, a steady and diversified industry with good wage levels and enlightened labour policies, and in addition an acute need for housing. Cities that met these requirements were then examined for suitable land on which these developments could take place. Possible sites would have to be located within relatively easy access (30 minutes maximum driving time) of the city so that the new community could form an integral part of the future growth and development of the city. These sites would, in their natural topographical features . . . wooded areas, rolling hills, etc., . . . have to offer the possibilities of attractive future development. They should have good farming land within their boundaries, and lastly, should be purchasable at the low cost of between \$100 and \$300 per acre (£20 to £60).

Eventually, four sites were selected, and four projects started. One, Greenbrook, N.J.,<sup>2</sup> however, was abandoned

in the drawing stage. The three remaining projects, Greenbelt, Greenhills and Greendale, are located respectively near Washington, D.C. (in the state of Maryland, actually), near Cincinnati, Ohio, and near Milwaukee, Wis. They are distributed widely apart in the Eastern half of the United States.

It is interesting at this stage to give some figures as to the amount of land acquired, its cost, and the extent of development for the various functions in all these projects.

Project.	Area purchased acres	Cost \$	Area for residential purposes acres	Area for community purposes	Future develop. acres
Greenbelt	3,411	574,000	120		3,100
Greenhills	5,930	1,699,168	140	1,783	4,006
Greendale	3,410	1,299,676	82	1,391	1,937

These figures give a broad idea of the distribution of the available space. In general terms, the pattern of the towns is as follows. A girdle of park surrounds the whole project, isolating it from the outside world. The billboard, the random gas-station, and the danger of traffic accidents are kept outside of this protective belt. In this area are, theoretically, the small farms and the individual allotment gardens for the residents of the town, and also the parks and woodland trails and general playgrounds. The community itself lies at the core of this protective belt, and embraces the communal group of buildings (educational and recreational) and the store group. The homes are themselves of three types ; predominantly row-houses, some individual houses, and some homes grouped in communal units or apartments. The structures are grouped in a few super-blocks with access by small culdesac driveways. Within these large blocks, the pedestrian paths wander freely with no relation to the more rigid network of the roads. This means that the normal suburban arrangement, where pedestrian side-walks follow the roads on either side and have to cross trafficked arteries at the frequent intersections, is not copied here. In most cases, when occasionally a thoroughfare has to be crossed, a pedestrian under- or over-pass is provided.

Although the general landscaping of the projects is done by the planning group, and the development is not left to the random and often quantitatively varying initiative of the inhabitants, the latter have gardens in the front and at the back of their houses which are their own private responsibility. This results in their taking a general pride in those portions of the town that are cared for by the management.



Let us now examine the projects in turn, and see in what respects they differ; how the general idea gave rise to widely varying realisations as a result of the different locational and site characteristics and of the treatment accorded the problem by each team of collaborators. It must be pointed out here that as unfortunately much of the money that had been originally earmarked for these projects was diverted later, all have suffered through not being carried out completely. Greenhills and Greendale suffered particularly badly. In Greenbelt, near Washington, we have the most complete demonstration. Much more money was spent on it than on the other two projects, and it is said that this favouritism had not a little to do with the proximity of the project to the Capital, and its consequent demonstration value to the more incredulous Congressman or Senator. So let us examine this project first.

As a showplace for Representatives and Senators! And if one has ever had the great misfortune to be in Washington during a hot summer's day, and then had the infinite consolation of visiting Greenbelt in the late afternoon, one realises the subtlety of the propaganda value of the project, especially when one considers that in the present "permanent crisis" the Government finds itself all too often chained to Washington whatever the season of the year.

For Washington is like the majority of the Eastern seaboard cities in summer—thoroughly unpleasant! In the hot, moisture-laden atmosphere, the ragged harshness of the city, the raucousness, the mechanical indifference and utter impersonality seem to take on heightened significance.

It was after such a day that we visited Greenbelt. And it is possible to imagine our relief when we finally turned off the

typically ugly American highway, plastered ad lib on either side with a motley collection of billboards, gas-stations, hamburger-stalls and tourist cabins, and then proceeded along a quiet concrete road, curving gracefully through fields and woods. For, as one swings easily around the bends, no offensive gasoline ad. blocks the beautiful vistas that unfold. For a long time, we travelled without a sign of the town, so well is it screened as the road skirts the green belt. To the right there is a glimpse of the charming artificial lake—two children are precariously Folboating. Up and around an incline and there lies the town, sweeping on a great horse-shoe curve around the central buildings.

The first reaction is one of sheer incredulity, for of all the things that one has come to associate with an American residential district, this has none of them. For it is quiet, peaceful and orderly. The neat buildings, unpretentious architecturally, group themselves in a formality that happily and unexpectedly avoids all mechanical rigidity (a trait all too common in most American public housing). The ever-present greenery, and the background of the enveloping forest serve to emphasise the essential humanness of the scene. One does not feel that here is the insistent demonstration of the genius of some individual; it is less an exhibition, and more a background against which lives can be projected—it fulfils a social function.

People move around calmly without that super-charged nervousness of the city-dweller. Children play in the sun in their playsuits and suntan; they scramble up and down the trees growing healthy muscles by climbing and not by pitching rocks into the windows of the tenement adjacent to the slum vacant lot. The culdesac courts buzz with neighbourly



The ever present greenery, and the background of the enveloping forest serve to emphasise the essential humanness of the scene.



The shopping centre of Greenbelt with a view of a group of apartment houses beyond.





GREENBELT—A view of a typical residential block showing the broad green spaces and illustrating the manner in which the flat- and pitch-roofed houses are combined in the scheme.

conversation to an accompaniment of hose-pipe music. One's immediate desire is to lease a house and settle down comfortably in Greenbelt!

There are 885 homes in Greenbelt. Five hundred and seventy-four are in group or row-houses practically all being in two-storey dwellings; 306 units are in apartments and the remaining handful are experimental isolated dwellings. Rentals are very reasonable, ranging from \$18 per month for the smallest ( $1\frac{1}{2}$  room) apartment, to \$39 per month for the seven room houses. The average rental is about \$31 per month with an estimated extra expenditure of 90 cents for water, and \$3 for electricity, the latter used for both cooking and lighting. The acceptable income ranges are between \$1,000 and \$2,200 a year (about £200 to £440 a year). Thus it can be seen that

the regularly employed better paid worker and the white-collared middle class group are catered for.<sup>3</sup>

The buildings are very simple and restrained in design without being anything exceptional architecturally. Plans are in general compact and workable, and there is a definite and satisfactory relationship in the interiors between the furniture and such elements as doors and windows. The furniture in Greenbelt was designed and constructed by the Administration, and is on the whole simple and pleasant.

Various types of construction have been experimented with in the houses, and the structural system is determined by the type of exterior finish adopted. The cinder block houses, for instance, have the exterior face of cinder block backed on the inside by aluminium-foil-backed insulation on furring, and



this is finished with plaster. The roofs of these houses are of concrete slab construction insulated and waterproofed. The brick faced houses are of the so-called brick veneer construction where half brick walling is backed by waterproofed studding, the framing of the house. The spaces between the studs are filled with Rockwool insulation and the inside finish is plaster on metal lathing. The roofs on these houses are pitched, with gabled ends, and covered with slate. A similar construction is used for other houses finished with asbestos siding (long horizontal "boards" of asbestos) instead of the facing of brick.

These various systems were tried for the purpose of assessing the relative merits of the finishes in practice. It was found that the cinder block wall was the least satisfactory, having to be repainted rather too often. The asbestos siding was found to stand up extremely well, requiring no maintenance and keeping a fresh and orderly appearance. The manager of the project feels that it might be worth covering the cinder blocks even now with asbestos because of the future saving in maintenance this way. Colour has been used to a certain extent on the painted buildings and is mainly on the horizontal brick bands between the windows. Pastel shades are used and it is noticeable how much more successful the red-brown range is than any other. This is undoubtedly due to the preponderance of green in the landscape, and red-brown with large areas of white, provides the most satisfactory contrast.

When one considers the buildings as whole units, it is noticed that some are rather arbitrarily broken backwards and forwards in order evidently to create variety and additional surface modelling. This is not successful and rather destroys the unity that might have existed without the breaks. The bands of recessed and projected brickwork tying in between windows is not offensive though hardly consistent and logical architectural thought. The units with the pitched roofs are rather clumsier than those with the more simple profile of the flats, but not being hipped, they are simple and formal and there are advantages claimed for them in their lack of maintenance (the waterproofing on flat roofs has to be replaced after a period of years) and in their capacity for storage (this has to be provided elsewhere in the flat-roofed house).

The community buildings are of the same general standard of architecture; pleasing, simple, without being anything outstanding. The exception is the swimming pool complex which is a sheer delight of imaginative design. A rather cumbersome piece of sculpture terminating the axis of the shopping court, blocks what might have been a good view of the pool from that point.

On the whole it must be said that the architecture shows a

pleasant unity of purpose despite the fact that it is the work of several contributing architects.

The Government of Greenbelt is of the City Manager type. This functionary is elected (with power of removal) by five council members, who are initially elected by all of the tenants. Cooperative stores, after having been initially run by the Consumer Distribution Corporation, are now in the hands of the citizens themselves. A group health organisation is also active, and takes care of medical complaints, short of operations, at a small monthly charge. (This is particularly significant as group health plans are a rarity in America being vigorously opposed by a rather reactionary policy of the Medical Association).

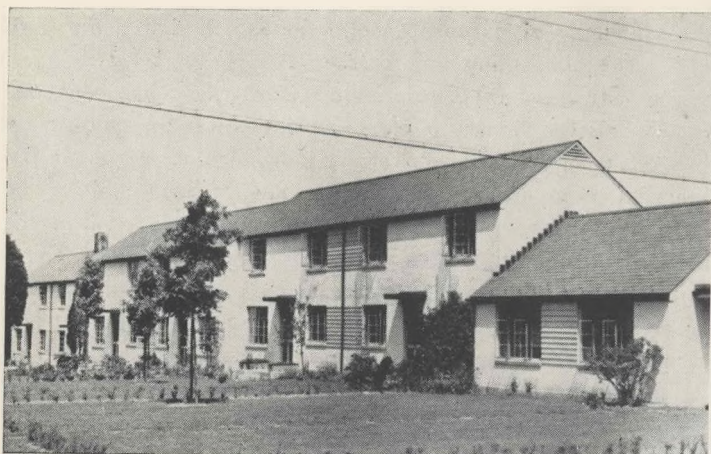
An interesting aspect of Greenbelt is the fact that its management has been in the hands of one of the architects who was originally engaged in the design of the project, ever since the completion of the project. This man, Mr. O. Kline Fulmer, has had the opportunity unique for architects of deriving vast experience of the maintenance problems of architecture, so often underestimated in their importance. Mr. Fulmer has taken the opportunity to carry out very interesting researches on Greenbelt and to compare it with traditional modes of building. Some of these researches have been published.<sup>4</sup> In all, the Government's experiments at Greenbelt will bring lasting and valuable lessons to housers and planners the world over.

Greenhills and Greendale, while conforming to the general Greenbelt thesis, are nevertheless not nearly as interesting as the Washington project. Both suffer sadly from being half-completed, and in the case of Greenhills, from lacking the natural beauty of the Greenbelt site.

The first impression of Greenhills is that it is very bleak and scattered; there is a conspicuous lack of that communal unity that distinguished Greenbelt. The layout does not appear to be as economical<sup>5</sup> as it might have been, but this expansiveness is due in some measure to the cutting down of the project even after it had got under way. The architecture is in general indifferent, with the exception of some of the larger units which are fair, and it bows rather low to tradition in the handling of the rather self-conscious buildings. The swimming pool is the most pleasant piece of architecture and is the same design as was employed at Greenbelt. The shopping arcade is pleasant. The new school is a clumsy horror. One is, however, left with the impression that although all the architectural opportunities were missed, the suburb is a better environment to live in than anything else to be found around Cincinnati.

In this project, more is made of farming within the limits of the project area than in Greenbelt. There are 60 families





GREENBELT—Pitch-roofed row houses showing the characteristic bands of coloured brick between windows.

living in the rural area whilst the allotment gardens totalling 500 (each 20 feet by 30 feet) are all in use.

Greenhills has 666 families in the suburb and it is significant that 85 per cent. of the residents own cars. The majority are employed as white-collar workers or as skilled craftsmen.<sup>6</sup> The 13 miles to the centre of Cincinnati is covered on a good fast traffic artery and there is an infrequent bus service operating.

The homes are once again in the form of both apartments and houses. In the former, there are 146 units, the majority being single bedroom types; in the latter, there are 524 units, some with as many as seven rooms. Rents, including electricity, heat and water, run from \$26.80, single bedroom apartment, to \$49.06, four bedroom house. These sums are very reasonable, but, of course, do not reach the lowest income bracket.

The Government of Greenhills is of the Mayor-Council type according to the Ohio State law. The cooperative stores have not been too satisfactory partly due to inefficient management and particularly due to the insufficient number of people in the town. The cooperatives will undoubtedly operate better when the project is extended. There are as yet no health arrangements but a full-time doctor and a part-time doctor live in the project. Sixteen per cent. of the yearly budget goes in management, and there is a surplus of about \$50,000 a year.

Greendale, Wisconsin, situated within 20 minutes' driving time of Milwaukee, is perhaps the least interesting of the three. It is, however, located in beautiful rolling farm country typical of Wisconsin. The place is also a delightful residential environment offering good opportunities for

leading a healthy family life. The architecture is very poor, however, and the site plan rigid and uninteresting. The communal buildings are also disappointing in the extreme being characterless and completely out of harmony with the vigorous idea that underlay these projects.

There are 572 families in the suburban area, and 65 farm houses within the project area. Many of the latter are occupied by people who do no farming. The inhabitants of the suburban area are mainly skilled factory workers and some white-collar ones, too. Two hundred and eight of these families live in group dwellings, the remainder in various combinations of single-houses, twin-houses, and row-houses. Rents follow very much the same pattern of the other two projects.

Greendale has a city manager type of government similar to that of Greenbelt. There are also cooperative stores here working fairly satisfactorily, and also two group-health plans. One offers medical service on a pre-paid basis, and the other on a health insurance plan.

These then are the Greenbelt towns!

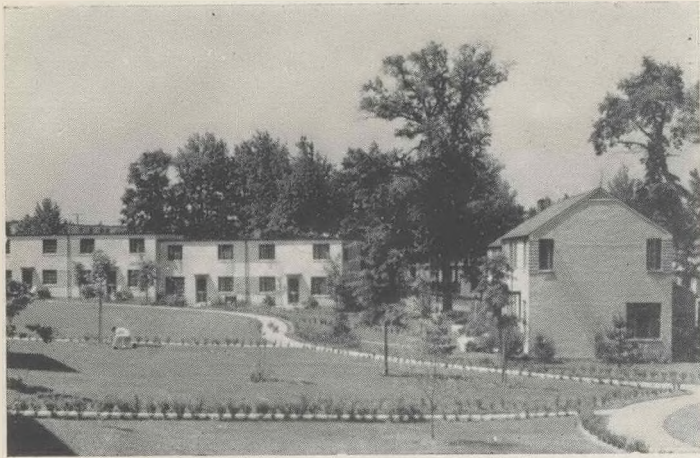
It might be well to conclude with some general observations on them.

It is evident that their significance lies not so much in the purely plastic manifestation, the architecture. This, limited as it was by rather conventional building methods (excused on the ground that the labour used, being mostly unemployed, was "unskilled,") resulted in the often indifferent building types. It is certain that the full resources of modern materials and their liberating effect on the plan have not been exploited; this mainly due to the fact that new materials are still expensive in America. It must be stated in the architects' favour that they have avoided, particularly in Greenbelt, some of the mechanistic and coldly inhuman tendencies



GREENBELT — The Swimming Bath





ANOTHER VIEW OF GREENBELT

common in some European modern architectural thought, and this was moreover not necessarily achieved by the picturesque. The main significance of the Greenbelt experiment lies, however, in their social significance—in the architecture, shall we say, of larger issues—and to evaluate this it is necessary to consider them as they function within the limits of our present society, and as they might be developed in the future.

In the pattern of our present society, based architecturally on the crowded and concentrated city, the Greenbelt town represents to its residents an escape—a haven of refuge for the privileged few of the thousands on the application lists—a retreat from the inhumanness of the American city. But we must clearly recognise that Greenbelt towns in our present society must remain the exception, the experiment, not the rule. The form of our cities is a direct result, a super-structural growth, of the economic foundation that determines the society. The repetition of the Greenbelt idea on a large scale, far from "strengthening the props" of our present social order, would directly assail the ramification of the real estate ownership and speculation industry, a fundamental feature of this society. So we must analyse the effects of Greenbelt upon its inhabitants taking into consideration their privileged position in an underprivileged society. And it is interesting that this reflects itself directly in their removing themselves to a large extent from the social and cultural movements of the larger urban mass to whom they still belong. Activities in Unions,<sup>7</sup> for instance, must necessarily decrease, and there is a danger that an air of complacency, born of the outward signs of security and satisfactory home life; a feeling of being removed from the struggles for a better life might remove these people from their larger social responsibilities.

In terms of the future, the Greenbelt idea has an entirely different significance. A future of planned production and distribution replacing the chaos of the present laissez faire system, will most probably bring with it vast changes in the distribution of our productive activity. One of the big tasks of future society will be to bridge the gap between the town and the country—to root out for all time the "idiocy of rural life." It is very conceivable that the city, being redundant and obsolete, will finally disappear to be replaced by a new organic relation between the farmer and the industrial worker, and their homes. It is in the view of the successful working of this interdependence in the Greenbelt projects that there is so much food for thought. We have now more than a vague vision of what some of the physical details of a future industrial-agricultural community might be. The Greenbelt movement will then be fundamental experience to draw upon.

There is one more social lesson to be drawn from these projects, and it has been commented upon in passing before. We have already seen the tendency to retreat from the larger sphere of social intercourse. There has, however, been a remarkable opposite demonstration within the project of a growth of real civic pride. These people were formerly the normal indifferent citizens of our cities, caring little for anything outside the boundaries of their immediate home. This change in their previous habits can be directly attributed to their being transported to an orderly, and a planned environment. In these projects, each citizen takes upon himself the duties and also the pleasures of his civic responsibilities. The Greenbelt residents prove that people can collaborate for their mutual good in home living as well as in factory production. The classical theory of the home—the hedged-in, all-excluding retreat—has been dealt a mortal blow.

It is on these broad issues as much as on the purely architectural and city planning ones that I conclude that the Greenbelt projects are one of the most significant and interesting demonstrations of new forms of home living we have had. But now what of the future of these admirable experiments in the housing field? Is the work so enthusiastically started being carried on? Greendale, the last of the projects to be completed, was ready for occupation in May, 1938. Since that date, no new demonstrations following up these experiences have been attempted. The era of constructive thinking and action of the heyday of the New Deal seems to have been as impermanent as it was exciting and hopeful. The plea has been that the nation's energies require to be devoted exclusively to the tasks of National Defence, but it must be insisted that the fight against reaction can only be successfully carried out if it simultaneously involves a sustained fight for progress,



for a better life. For one cannot mark time! Either one advances, or one falls back! It is in this sense that it is to be hoped that experiments of the nature of the Greenbelt Towns will continue in the future.

Author's note: This article was written in August, 1940, and consequently some of the conclusions expressed in the last paragraph might be slightly out of date in this swiftly moving and changing world situation.

#### NOTES.

<sup>1</sup> The Tennessee Valley Authority operating as it does more in the wider sphere of regional planning is not taken into comparison here.

<sup>2</sup> Some private "interests" living in the vicinity of Bound Brook New Jersey, where this project was to be located, brought court action resulting in an injunction against this project. I have examined the plans, and, in my opinion, this project would have been the best, architecturally, of all; all the more regrettable that it was aborted in the drawing stage.

<sup>3</sup> The great majority of residents are white-collared employees of the Federal Government in Washington.

<sup>4</sup> See, for instance, the "American Architectural Forum," for July, 1940.

<sup>5</sup> The roads and sewers are c. 19 miles in length in this project as compared with c. 11 miles at the other two. This gives a good indication of the wasteful planning.

<sup>6</sup> Cincinnati is the centre of a tool and die making industry.

<sup>7</sup> The United Federal Workers' Association, the Union of Government workers, is notoriously weak in Greenbelt.

#### ACKNOWLEDGMENT OF ILLUSTRATIONS

Photographs appearing on pages 360, 368, 374, 378, 379, 381, 383, from "The Architectural Forum," New York, August, 1939; photograph's on pages 371, 372, from "Soil—the Nation's Heritage," a publication prepared by The Land Grant Colleges and Universities of the Tennessee Valley States, Co-operating with the United States Department of Agriculture and the T.V.A.; Plan on page 384, reproduced from a reprint "Greenbelt Planning," from "Pencil Points," New York, August 1936; photographs on pages 387, 388, 390, 391, by O. Kleine Fulmer.

## PROFESSIONAL NOTES AND NEWS

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Transvaal Provincial Institute of Architects,  
Johannesburg.  
Dear Sir,

RE: MECHANICAL DRAUGHTSMEN.

Due to the prevailing acute shortage of mechanical draughtsmen, it is suggested by my Committee that the possibility exists of your having unemployed architectural draughtsmen in your organisation. Such persons, it is felt would be very adaptable to mechanical drawing and my Committee would esteem it a favour if you could advise of any architectural draughtsmen who could temporarily be employed in mechanical drawing offices.

Yours faithfully,

Signed D. B. BEUCKSCHIFF,

Secretary: Local Advisory Committee.

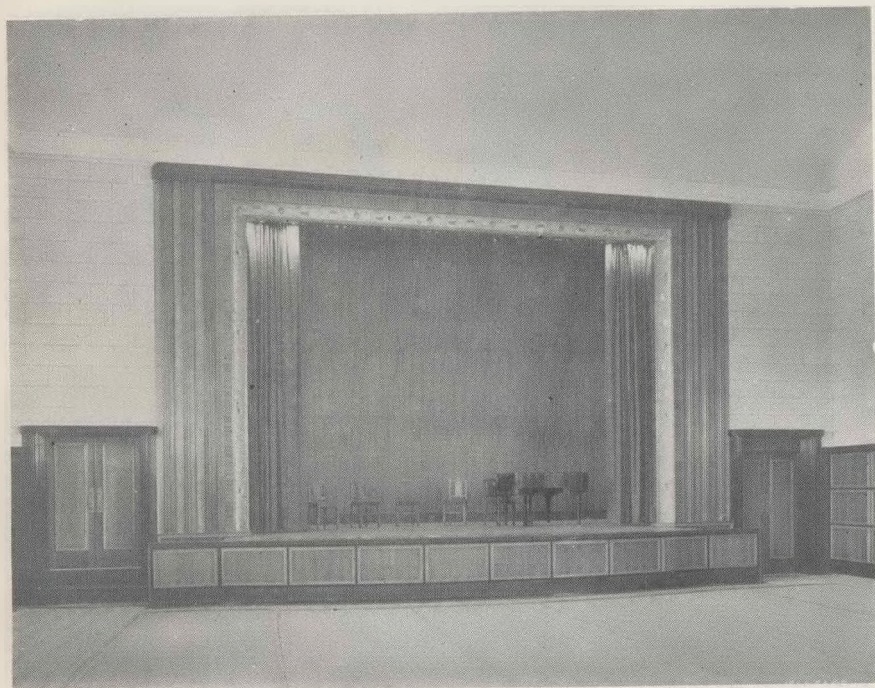


## THE SELBORNE HALL, JOHANNESBURG

ANOTHER EXAMPLE OF THE CRAFTSMEN'S INTERPRETATION  
OF THE ARCHITECT'S DESIGN

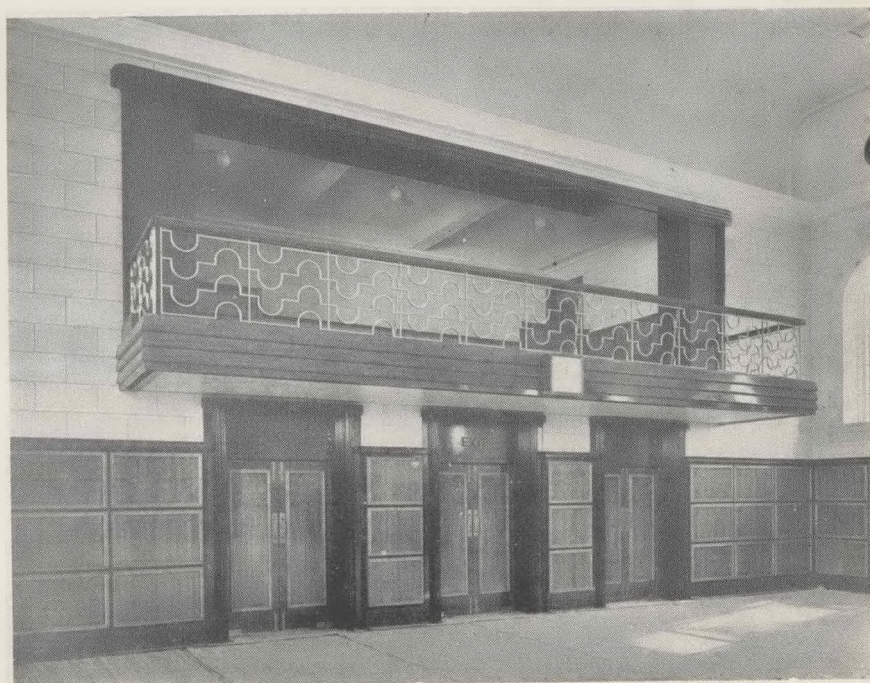
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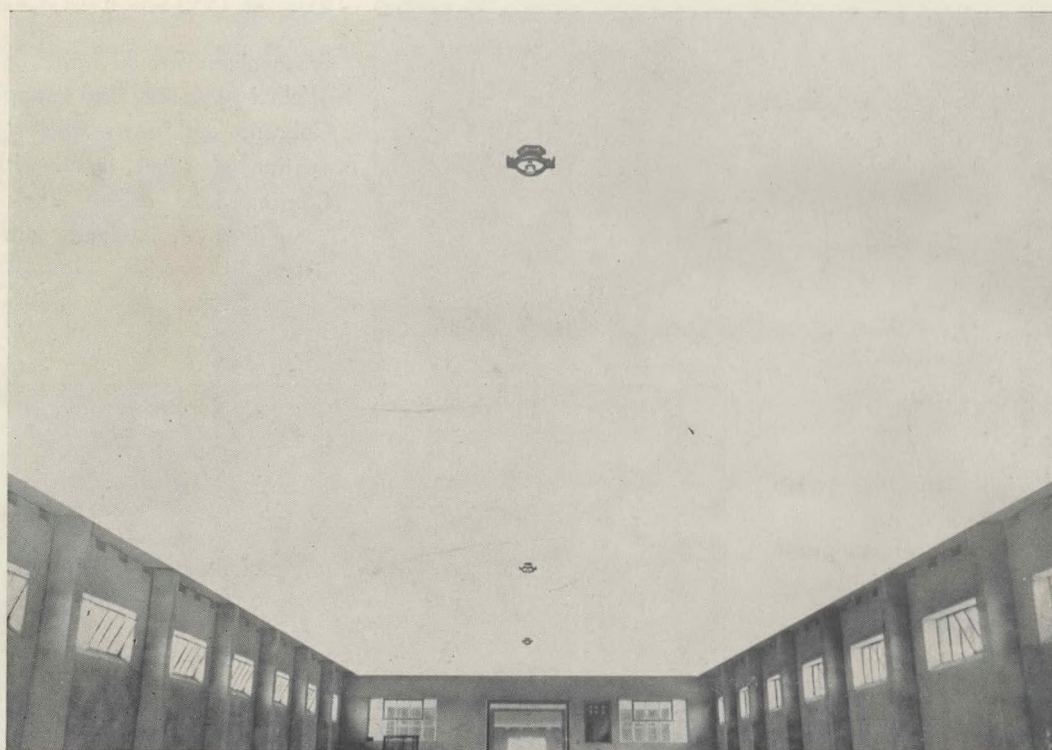
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