The Faith of an Engineer

A Discussion on

THE LAND PROBLEM

by

SIR RONALD EAST, Kt., C.B.E., M.C.E.
M.I.C.E., M.I.E.Aust., F.A.S.C.E.

ENGINEERING is the art of organizing and directing men and of controlling the forces and materials of nature for the benefit of mankind.

Inscription on plaque at the Eildon Dam.

Registered in Australia for transmission by post as a book.

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Chairman's Address to the Melbourne Division of The Institution of Engineers, Australia.

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THE AUTHOR

LEWIS RONALD EAST, born in Melbourne in 1899, was educated at Ringwood and Malvern State Schools, at Scotch College and at the Melbourne University, from which—after an interruption for war service with the Australian Flying Corps — he graduated in Civil Engineering with Honours in 1922.

He joined the staff of the State Rivers and Water Supply Commission and was associated with many rural and urban water supply projects throughout the State of Victoria. In 1935 he was appointed a Commissioner and the following year to be the Chairman of the Commission, which position — with that of Commissioner of the River Murray Commission — he held for the next 28 years until his retirement in 1965.

As Chairman, he directed the planning and construction of developmental works of very great magnitude — including the large Eildon Dam storing 2,750,000 acre feet, and the Rocklands Cairn Curran, Tullaroop, Lauriston, Eppalock and other reservoirs and irrigation works, town water supplies, river improvement and drainage undertakings and other works involving the expenditure of some $250,000,000 over the period of his leadership. He was also a member of the Commonwealth-State Committee which evolved the great Snowy Mountains Project. His work was recognised by the C.B.E. in 1951 and a Knighthood in 1966.

He was President of the Institution of Engineers in 1952 and a Vice-President of the International Commission on Irrigation and Drainage in 1959-62, and was the recipient of awards from Engineering and other professional societies and from the University of Melbourne for his engineering and other achievements.

The Faith of an Engineer

By L. R. EAST, M.C.E., M.I.E.Aust.*

Introductory

RETIREMENT from the position of Chairman of the Melbourne Division of The Institution of Engineers, Australia, gives me the opportunity of talking to you on any subject that I might care to choose, and, over the past twelve months, I have given a good deal of thought to this matter. A past chairman frequently speaks of his life's work, and I would have liked to have talked on the "Future of Water Supply in Victoria." In fact, I actually set out to prepare my address on that subject.

However, as the time to speak has drawn nearer, it has been increasingly borne upon me that that was not the subject on which I should speak — that there was a far more urgent and far-reaching aspect of engineering of which I had been permitted to see a little, and of which I should speak.

I find it hard to give a title to my address. You can, if you like, call it — "The Faith of an Engineer."

I am not going to give you a code of ethics, or tell you what I think engineers should be, or should do. I am going to tell you, as simply as I can, what I myself believe in regard to the work of the engineer, and its effect on the community.

First, I want to disclaim any idea that the engineer has a higher sense of duty or obligation to the community at large than have other professional men, or men in many other occupations essential to the life of the nation. As a man, the engineer is much the same as other men.

He does not, as a rule, take up engineering and practise it because of the great opportunities it gives for public service; he does so, in the first instance, because he likes it.

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*Being the Chairman's Address delivered at the Annual General Meeting of the Melbourne Division of The Institution, on 17th April, 1945.

We have something there that is not always the possession of those entering some other professions. Men do not enter the engineering profession to attain high social status, nor does it offer to many much in the way of monetary reward. Nevertheless, there will always be boys who will gaze with wonder and longing at flashing con-rods and spinning flywheels — who will take the kitchen clock to pieces and meddle with the gramophone.

These are the boys who later will be making toy boats and model aeroplanes, who will astound the family by producing a three-valve radio or a small working steam engine from bits and pieces.

They do it because they like it, and if, when they grow up, they are given the opportunity of becoming engineers, they continue to practise engineering because they like it. How many of you would wish to change jobs with the doctor, lawyer, preacher or politician, or with the farmer or fruit grower? There are satisfactions to be found in the work of all of these — but, for the true engineer, these satisfactions do not measure up to what is to be found in engineering.

We must admit we work at engineering because we like it, and we are constantly trying to improve and perfect our works and designs — not really for the sake of our employers or of the community, or of posterity, but for the very work's sake itself.

We enjoy directing the forces of nature to our use, and we take great pleasure in the beauty of a smoothly working machine or a satisfying structure. This is the point which I wish to make. Our efforts are directed towards the solution of mechanical or electrical or structural problems — physical problems — and when the machines or structures are built, we wash our hands of them. except to see that they are maintained properly, and we turn our efforts to further contests in which we seek to reconcile the unchanging laws of nature to the changing desires of man.

We look on the works which we have created with our imagination and our hands, and we see that they are good, and we are content to leave to others the use and exploitation of the results of our efforts.

This, we say, is a job for business men, and economists and politicians, and we have left it to them.

As for the result, if we take a long range view over the centuries, we can say that the march of science has been a glorious one of spectacular advancement for the well-being of mankind. If, however, we view the process close at hand, in a single life span, we cannot help but be shocked at the waves of unemployment and human misery which come again and again, and spread wider and wider, to deny to the masses of men the benefits which so many believe to be within their reach.

Technocracy

Engineers are not to be led astray by the writings of so-called technocrats, who claim that industrial development has already reached the stage that machines and a few men can produce more than enough of everything to satisfy the reasonable desires of all men — and that we must plan for leisure rather than for employment.

This is just nonsense resulting from the extension of the particular to the general. American shoe-making machinery may be able to turn out many more shoes than American feet can wear out, but very little knowledge of industrial possibilities is required to demonstrate that all of America's machines, and all of America's manpower —working full time — will be unable to satisfy all of America's desires, let alone the desires of other lands.

The problem of production, for hundreds of years yet to come, will be a problem of manpower to produce the raw materials, and manpower to make and operate the machines.

Obviously, there should be no widespread unemployment in an intelligent world. There are very few people, however, who do not fear unemployment and expect it to recur on a large scale.

All are agreed that the most urgent problem today is not production but distribution, and many and various have been the explanations given and the theories evolved —on paper — for its solution.

So much has been written and spoken on the subject of recent years that business men no longer dare speak of "over-production." They all now call it "under-consumption." There is no need for me to labour this point—it has been preached *ad nauseum* from every soap box for the last fifteen years or so, and has been the theme of hundreds of pamphlets.

Social Credit

An almost painless solution is offered by some monetary reformers who lead their readers or listeners along well-trodden and universally accepted paths of criticism of present unstable economic conditions into a fog of "Social Credit," and out into a "New Order" of plenty, security, and leisure.

The once-famous "*A* plus *B* Theorem" and the pseudo-mathematics of Major Douglas, formerly the mainstay of "Social Credit" have had to be abandoned, but those who have succeeded him hold fast to the basic idea of plenty through credit.

It is difficult to combat a widely accepted idea which has a grain of truth in it, and it is not my purpose tonight to do so. I might mention, however, that the "*A* plus *B*" idea in regard to prices is far from new. An old history book, by Rose, gives one of the London street chants of the Chartist times of 100 years ago:—

If Wages formed the price of goods,
Yes, Wages made it all,
Then we who work to make the goods,
Could buy them one and all,
But if the price be made of rent,
Tithes, interest, profits, too,
Then we who work to make the goods,
Can buy but very few.

The idea that there was insufficient purchasing power to buy all goods produced was widespread even in those days.

Machinery and Employment

I mention this just in passing, and in the same brief way I will comment on the widely-held, but entirely

fallacious, idea that machines create unemployment. It should not be necessary for me to say much to engineers about this, but I am certainly amazed that so many engineers accept as true the charge that they are constantly creating an unemployment problem.

The truth is that precisely the opposite is true. The scientist and the engineer have provided opportunities for the employment of millions of men and women who have been enabled to attain a standard of living far above that of the peasants of countries which have not yet reached the machine age.

The motor car was almost unknown when I was a boy. The motor car industry now employs more people in the world than any industry other than agriculture. It has displaced practically none, and has certainly promoted the groom to a motor driver, and the farrier to a motor mechanic, and in both cases given an easier life, and a higher standard of living.

The radio industry has blossomed in twenty-five years to become one of the great employers of labour. Air transport promises equally large opportunities — and as for plastics, no one has yet dared to set a limit to what can be expected of this new industry.

The power shovel, the crane, and the bulldozer do not, in the main, displace labour; they do work which, in practically all instances, would not be done at all if the machines were not available. For every contractor who buys a power shovel or dragline, and sacks a hundred men, there are scores of contractors who had not entered that field of effort at all before, who buy machines and engage additional labour to operate them. Those who build and operate machines far outnumber the pick and shovel labourers displaced.

The war has brought home to all the fact that human effort is, in the last resort, limited by manpower, not by money or credit. Machines should, at all times, be regarded as extending the power, pace or precision of human effort, and reducing the overall cost in man-hours of any form of production, whether it is of vegetables or radios, boots or houses.

The objective of science — whether conscious or not —is to produce new goods or better goods and to produce them at less and less cost in human effort.

Where is the Benefit?

The conversion of that cost into price is, however, not regarded as a matter for the engineer or scientist at all. I am not suggesting that it should be, but I do suggest — and this is the main purpose of my talk — that engineers and scientists should follow through their work to see where the benefit goes.

If a million gallons of water turned into a water-works system fails to reach the water user — and it seldom does all reach him — the hydraulic engineer endeavours to satisfy himself as to what happens to the water which is lost. If 100,000 kW is lost in transmission, the electrical engineer wants to know all about it. If ten thousand horsepower is applied to a pumping installation, the engineer in charge expects to lift a certain quantity of water.

But when it comes to benefits not measured in Greek symbols, or other technical hieroglyphics, the engineer is not concerned at all.

I want to draw your special attention to this question of benefits from engineering works. Take the simple case of a modern lift or elevator, a product of the engineer. Whom does it really benefit? At first, one might say that the tenant or shopper is saved from climbing six or ten flights of stairs. On second thoughts, we realise that no shopper would climb six flights of stairs, and few tenants would work or live as high as that unless there were lifts in the building. That, obviously, leads to the owner of the building as getting the benefit of the invention of lifts, because he can charge higher rentals for the upper stories of his building. This is true only to a very limited extent as, if the profit from the high building were considerable, there would be more high buildings erected, and competition for tenants would bring the rentals to a reasonable level.

But there would still be some buildings for which tenants would be prepared to pay more than for others

because of their situation. This is a matter beyond the control of the owner or prospective owner of the building. It is a matter of geography — the location of the site and its relationship to traffic facilities and to other businesses.

The owner of the site knows all this, and values his site accordingly. Even if he were a simpleton and unable to guard his own interests, competition for the site would mean that its price on the open market would contain not only the capitalised value of all the road and railway and other public services and facilities, not only the advantages of location in regard to the business of the city, but also the capitalised value of the fact that the installation of electric elevators will enable the purchaser to erect and use a ten-storey building on the site. All of this will go into the selling price of the land, and all that the owner of the building will be able to retain ultimately as nett profit will be not more than five per cent. on his overall investment.

The profit on the land transfer may, however, be enormous. The invention of the lift or elevator has increased the site value of city land by at least five times. Imagine the collapse of the values of multi-storey buildings and of vacant building sites in commercial centres if the installation and operation of lifts were forbidden by the building by-laws!

Few people realise that the value of a great city building is frequently less than the value of the site— perhaps only a fraction of an acre — on which it is built.

One of our finest buildings, the Manchester Unity Building, opposite the Melbourne Town Hall, is valued at £250,000, while the land on which it is built — little more than one-sixth of an acre — is valued at £300,000.

On the opposite corner, the old building on Damman's Corner is valued at only £4,650, while the unimproved value of its site — one-seventeenth of one acre — is £115,440.

Some details of these and other well-known city properties should be of interest, and are shown in Table I.

In the sites of these buildings there have been concentrated the benefits of all the public works that provide

access, water, sewerage, power, and other services, as well as the advantages of location, and so on.

In the outer suburbs, benefits from the construction of a new tramline, or the extension of water or sewerage facilities, or of electrical power lines, are too obvious to need stressing.

The results are immediate; they are frequently quite spectacular, and are very gratifying to the fortunate owners of land in the areas which receive the benefit of public expenditure on these works.

The land naturally becomes more attractive for residential, industrial or commercial purposes, and competition for it between those who are seeking home or factory or shop sites quickly brings the offers for land up to what the least hungry of the owners will accept. The competition is made much more acute, and the price rise more rapid

TABLE 1

Property.	Value of improvements.	Value of site.	Area of site.	Value of site per acre.
	£	£	acres.	£
Damman's Corner, cnr. Collins and Swanston Streets	4,650	115,440	0.059	1,950,000
Manchester Unity, cnr. Collins and Swanston Streets	250,000	300,000	0.177	1,690,000
Century Building, cnr. Swanston and Little Collins Streets	166,800	159,600	0.153	1,040,000
Victoria Building, cnr. Collins and Swanston Streets	12,500	87,646	0.090	975,000
Young and Jackson's, cnr. Flinders and Swanston Streets	4,500	158,025	0.134	1,180,000

because of the presence in the market of speculators who have no intention of using the land themselves and employing labour to build upon it, but whose idea is to hold it unused until the need for land in those areas becomes

sufficiently acute for them to sell again at an enhanced price.

The early owners, who bought or selected land in the district for farm or orchard purposes before the coming of the tramline or other public facilities, may have had no idea of retiring on unearned increment; nevertheless, many have been enabled to do so. The investor in vacant land, however, is not an accidental beneficiary from public expenditure. He is a calculating and deliberate parasite.

That description may shock some of you, who have never tried to ascertain the distribution of benefits from public expenditure, or to track down the leakage that seems always to deprive the masses of the people of the advantages which they might reasonably expect to receive from scientific and technical progress.

Very little research would bring to light some challenging facts.

Cost of Home Sites

The home-site is the basic requirement for home building, whether for prospective owner-occupiers or for investors in a residential property, and the cost of the home-sites has a very far-reaching influence on the housing problem.

As the cost of buying sites goes up, the numbers of those who can afford to buy them go down. The effect of this on the problem of population has not received much attention, but it is by no means insignificant. We all know of numbers of young people who have postponed their marriages for years while they have been saving up to buy an allotment on which the Savings Bank would build a home for them.

Effect of Speculation

The investor or speculator in vacant sites is undoubtedly "Public Enemy No. 1," as far as housing and industrial development are concerned; for his activities, firstly in buying, and then in holding sites, force up the cost of land to those who require sites for homes or factories.

Many country towns and townships have been marred by the activities of speculators in township lots. Development has been unbalanced, and the provision of services, such as paved roads and footpaths, drainage, water supply and sewerage, made more costly — and in many cases impossible — because of the numbers of vacant lots between buildings.

Control of the "Vacant Lot Industry" is largely in the hands of the municipalities and the governments, which have the power of taxation and legislation.

The present "market value" of vacant or partially used land adjoining great cities is due to the withholding of these areas from the market until the demand for land is so great that the owners — or speculators — cannot resist the offers they receive from persons urgently needing sites for homes or factories, or other uses. Then they sell, and valuers note these sales as determining values.

Around every Australian city there is held, practically idle, enough vacant land subdivided into allotments to provide for populations of double those now in those cities. All these idle lands are valued at the prices paid for the relatively few allotments which owners have been tempted to sell.

A census of vacant lots around Melbourne, with information as to values put upon them by their owners, would give illuminating information in regard to the home-site problem. Such a census should be made.

If all owners of idle subdivided land were *forced* to auction their holdings, and buyers were confined to prospective users, there would be an astonishing collapse of prices, and even then the greater part of the idle land would remain unsold.

The market price of urban land is quite artificial, and results from speculative holding of land until "ripe" for development.

There is, in fact, no way of discovering how much of the present value of land is speculative except by killing speculation. The only way to discover the true value is the practical method of so taxing land values as to prevent the holding of land out of use. If this were done, the value of land would sink to its true economic level.

The development of our towns and cities has been distorted by the operations of land speculators who have been primarily responsible for the housing shortage, in that they have made home-sites too dear for the working man, and they should be taxed out of existence — not compensated at public expense, as occurs when land is bought for State housing purposes, at "Market" values.

In very many countries, attempts have been made to collect for the State some part of unearned increment, but, as far as can be be ascertained, satisfactory results have never been achieved by any system of levy other than an annual tax or rate on land values.

Fundamentally, of course, it is now recognised that alienation of land has been a mistake, and that, had the land-use of the whole country been pre-planned, the title to all land would have been retained by the Crown. Had this been done from the outset, the government would not only be in a position to control development and prevent exploitation by speculators, but it would also have had such a large assured revenue from land rentals, that other forms of taxation now levied on industry could have been kept at a much lower level.

However, from a political point of view, it would probably be easier for a government to collect unearned increment by taxing or rating alienated lands than by increasing ground rents on thousands of Crown tenants in large government-owned housing estates.

Churchill on Land Policy

The Rt. Hon. Winston Churchill some years ago gave quite a lot of attention to the land value problem, and some of his speeches on this subject were published in book form, in 1909, under the title *Liberalism and the Social Problem*.

Mr. Churchill put the matter in his usual picturesque way:—

> See how this evil process strikes at every form of industrial activity. The municipality, wishing for broader streets, better houses, more healthy, decent, scientifically planned towns, is made to pay, and is

made to pay in exact proportion, or to a very great extent in proportion as it has exerted itself in the past to make improvements. The more it has improved the town, the more it has increased the land value, and the more it will have to pay for any land it may wish to acquire.

The manufacturer proposing to start a new industry, proposing to erect a great factory offering employment to thousands of hands, is made to pay such a price for his land that the purchase price hangs round the neck of his whole business, hampering his competitive power in every market, clogging him far more than any foreign tariff in his export competition, and the land values strike down through the profits of the manufacturer on to the wages of the workman.

It does not matter where you look or what examples you select, you will see that every form of enterprise, every step in material progress, is only undertaken after the land monopolist has skimmed the cream off for himself, and everywhere today the man or the public body that wishes to put land to its highest use is forced to pay a preliminary fine in land values to the man who is putting it to an inferior use, and in some cases to no use at all. All comes back to the land value, and its owner for the time being is able to levy his toll upon all other forms of wealth and upon every form of industry.

Mr. Churchill went on to advocate the taxation of land values to remedy this condition.

New Zealand had adopted this policy for very much the same reasons, and the Honourable Walter Nash, Minister for New Zealand in the United States, recently commented upon this matter in an address given to the Citizens' Housing Council of New York on 23rd January, 1943, when he said:—

> . . . The provision of adequate housing can be seriously handicapped and retarded if abnormal prices have to be paid for the land that is required. A sound and scientifically based system of taxation can help a great deal by correcting such a situation.

Land Cost Reduced by Taxation

A remarkable but little known consequence of rating or taxing on land values is its effect in reducing the selling price of vacant land, enabling home-builders to purchase sites on more reasonable terms, and benefiting tenants by lower rentals.

When rating on land values is introduced in any municipality, the holding of vacant land for speculative purposes is made less profitable, and large numbers of vacant lots are put on the market at lower prices.

Effect on Housing

The transference of municipal rating from rental values to land values:—

(i) greatly increases rates on vacant land, and discourages speculative buying and holding for a rise, with consequent reduction in cost of home sites;

(ii) increases rates on properties where inferior or slum buildings are on valuable land, and therefore exerts pressure on owners — usually investors — to improve the buildings or replace them with better buildings;

(iii) reduces rates on highly improved properties, and therefore encourages owners to improve their buildings.

Benefits to Housing Authorities

Where land is cheapened by land-value rating, Housing Authorities can buy more sites for the same expenditure of funds, and, as a consequence, can either build better houses or provide larger gardens or charge lower rentals. The saving in municipal rates, too, is considerable, and may make all the difference between economic rentals and subsidised tenancies.

Victorian Building Industry Concerned

The building industry is beginning to be concerned at the effect of taxation on their operations, and Mr. D. B. Doyle, President of the Building Industry Congress

of Victoria, in a letter to the Melbourne Division of The Institution of Engineers, Australia, wrote recently:—

> Research reveals that in the municipalities which rate upon an Annual Value Basis, the rates in 1940 aggregated to £914,000 upon improvements and only £307,000 on site values.
>
> In these cases the rating system imposes, in effect, a tax of almost a million pounds upon improvements in Greater Melbourne annually. It would appear, therefore, that the transference of these rate burdens from the buildings on to a land value basis is a matter of vital importance to the building industry.
>
> Apart from relieving the industry from a heavy direct tax upon it, the increase in the charges upon land values should tend to make holders of vacant or poorly improved sites build upon or improve their properties with beneficial results to the industry and all connected with it.

The Land Problem and The Farmer

For more than 150 years, practically all economists have given a great deal of attention to what has come to be known as "The Land Problem," and it is remarkable that today the man in the street — or on the farm — knows so little of the fundamental economic principles which have for generations been universally accepted by all writers on economic subjects.

Even students of economics are apt to take these basic principles for granted, as being of not much importance, and to hasten on to lose themselves in graphs and statistics as representing the real problems with which they are concerned.

It is, however, everywhere accepted that, somehow or other, high land values have had a good deal to do with the bankruptcy of farming of recent years, and practically all of the statements issued by "study groups" planning for social reconstruction after the war refer to the problem of land speculation. These statements give a valuable indication of the trend of public opinion on this subject.

A Joint Church Committee in a published statement said, *inter alia*:—

> Adequate means should be taken by the public authorities to prevent the sale of land at inflated prices.

Another Church statement on Reconstruction recommended the following measures as necessary to a sound system of rural finance:—

(a) The stabilisation of land values and the elimination of speculation and gambling in land.

(b) A limitation upon the right of mortgaging or selling rural property . . .

There is a much greater turnover in land than is commonly appreciated, but it is unlikely that the majority of buyers or sellers of rural lands would recognise themselves as "speculators" — a term usually indicating that the main purpose of the buyer acquiring property was to sell it at a profit. The profit motive would undoubtedly be present, but most purchasers would be buying land with the intention of farming it, and many of the properties they acquired would be on the market because of the bankruptcy, sickness or death of the owners.

If the factors which determine the market price of land were more fully understood by those who endeavour to make a living on the land, farmers would be in a much better position to understand the reason why farming is so seldom profitable.

Land occupies a very peculiar position in that it is non-reproducible and hence has no cost of production. The value of land is the capitalised *nett* income, or "Economic Rent."

The selling price of land — or land value — is simply capitalised rent. When land is purchased the payment made for ownership is the present-day lump sum paid in lieu of perpetual rent.

As long ago as 1776 Adam Smith wrote that "Rent, considered as the price paid for the use of land, is naturally the highest which the tenants can afford to pay in the actual circumstances of the land."

He also pointed out that high or low rent was the result of high or low prices of commodities — not the cause.

The celebrated "Law of Rent' to which Ricardo's name has been attached goes a step further:—

> The rent of land is determined by the excess of its produce over that which the same application can secure from the least productive land in use.

As the rental value of the land may, under some circumstances, be expected to increase in the future as population and demand for land increases, the lump sum which purchasers may be prepared to pay is frequently much more than the present-day rental capitalised at ordinary ruling interest rates, and few purchasers of farm lands can, therefore, show a four or five per cent. return on their investment.

There are also other reasons for high prices for farm lands.

In a report presented to the New Zealand Parliament in 1939, B. L. Dallard, Under-Secretary of Justice, explained the upward move in land values to 1930. He wrote:—

> Farm costs move behind market values. The high prices of immediate post-war years consequently increased the farmers' nett profits at a higher rate than the rate of increase of market prices.

. . . . . .

> The high profits of the farmers were capitalised in land prices, which quickly reached absurd levels. Two other factors tended to increase these values. The first was the purchase by the Government of land for the settlement of returned soldiers. The second was the reduction in direct taxation.
>
> The result of the wave of prosperity referred to was an extraordinary land boom.
>
> In the twelve immediate post-war years (1919 to 1930) 418,914 transfers of land were registered.

> The total area comprised in these transfers was 28,653,739 acres, and the total consideration-money shown was £462,027,881.

He pointed out that between 1913 and 1930 the unimproved value of land increased by 59 per cent., and mortgages increased by 188 per cent.

There are, of course, many other factors which influence land rentals and prices in particular circumstances, but few farmers are aware that, on the whole, the market price of land absorbs all the advantages of good land, and that, *if interest on their purchase price is considered,* they have little hope of obtaining a better return *for their labour* from a very good farm than from a very poor one into which the same effort is put. The difference in gross returns is absorbed in interest.

A reduction in land tax or water rates is also of no permanent advantage to the *farming industry,* for the advantages are capitalised in increased selling prices as soon as farms change hands, and the reduction is, therefore, a handicap to the incoming farmers who will have to pay more for their farms and will have less of their capital left for improvements.

Similarly, subsidies on superphosphate, concessions on rail freights, and even the discoveries of agricultural scientists, rapidly pass into land values. A news item appeared recently to the effect that the discovery that the application of minute quantities of certain mineral salts to poor lands in South Australia would make up for mineral deficiencies in the soil and increase the carrying capacity of the land, had increased the value of the land from 5s. 0d. to £5 per acre.

In New Zealand, it has been found that the stabilisation of the prices of primary products had affected land values to a marked extent.

E. H. Langford, Secretary and Economist to the Minister of Supply in New Zealand, commenting on the effect of increasing land values on price stabilisation, said, in 1942:—

> One of the seemingly incurable variables is land values, and these fluctuations tend to destroy stabili-

sation no matter how effective other price control machinery may be. Every increase in price to the producer has its effect . . .

All increases in profit margins find their way into land values.

Similar difficulties are being experienced in Australia in connection with the subsidy to the dairying industry, and the Minister has announced that the Government is taking action to prevent the benefits being absorbed in increased land values. For the time being, the Commonwealth may be able to prevent sales at "inflated" prices, but ultimately the pressure for land will be such that control of values will be very difficult. In the absence of a sound National Land Valuation System, even the present control cannot be regarded as giving satisfaction to anyone.

Actually, talk of stabilising land values by regulation is absurd, for the value of land rises and falls under the influence of factors which no decree can govern.

In May, 1936, the New Zealand Government passed legislation guaranteeing farmers fixed prices for their dairy products for a whole season in advance, irrespective of market price fluctuations. It was asserted that this policy was resulting in speculation in farm lands in the dairy districts. Dealing with this point, the Prime Minister, the Honourable M. J. Savage, said:—

> In shaping taxation methods we will have to apply a remedy. There is more than one way of preventing a land boom . . . The man who had done the best out of land in the past was the man who has farmed, the farmer . . . The purpose of the land tax is, in principle, to obtain for the community the values created by it. The principle behind the policy of the Government is to ensure to those who utilise land the maximum payment for their labour. In other words, the farmer's eyes should be on the return for his products rather than on the . . . possibilities of profit . . . from land sales.

Where land is held as private property — as it is here — a farmer's status in the community is determined

more by the value of the land he owns, and what he could get if he sold it, than by the use to which the land is put.

Land Tenure

If we read our own history carefully we would find that private property in land in England is, comparatively speaking, an innovation of only a few hundred years' standing, and, in fact, is much less absolute than is commonly taken for granted.

Since the Norman Conquest of England, almost nine centuries ago, common law theory has maintained that private property in land is held subject to the rights of the Crown.

An outstanding constitutional authority, Sir Frederick Pollock, has expressed himself on the subject of ownership of land in the following way:—

> It is commonly supposed that land belongs to its owner in the same sense as money or a watch; this is not the theory of English law since the Norman Conquest, nor has it been so in its full significance at any time. No absolute ownership of lands is recognised by our law books, except in the Crown.

Sovereign Powers

The State, in the exercise of its sovereign powers, has, in the past, greatly affected rights in private property by building regulations, by taxation, by removal of transportation facilities, and by other means, without any payment of compensation whatever, and the control of land-use to preserve amenities or to regulate development in the public interest has not, in Australia, been regarded as requiring special compensation.

Certain rights over land are commonly retained by the Government. Among these which reside with the power of sovereignty are:— the right of taxation; the right of eminent domain, and those rights which may be exercised by the State under the police power to protect the public welfare.

In Great Britain, the flow of rivers is private property, and cities have paid enormous sums for the right to take water. Coal seams were private property, and the Government of Britain has recently approved of the payment to private land-owners of some £63,000,000 for their "rights" to mining royalties on coal beneath their lands.

In Victoria, however, private rights in water — riparian rights — were abolished long ago, and communities cannot be held to ransom when they require water from our streams. Similarly, mineral rights are restricted in this State.

It is not so long since chattel slavery was regarded as indispensable to the economic system. That view is no longer held, and property rights in human beings are a thing of the past. Denouncement of slavery would not now be regarded as an attack on "Capitalism."

Capitalism

This term "Capitalism" itself deserves some attention. Charles H. Ingersoll, "the man who made the watch that made the dollar famous," in a broadcast a few years back, made some most interesting comments.

"Capitalism," he said, "is a coined word of Socialism, representing its confused idea of exploitation and its causes. Capitalism contains two utterly opposing elements, one legitimate and the other monopolistic; the one operating for, the other against, popular interest. Capitalism, in its proprietorship of private enterprise, should be impregnable, unhampered and untaxed, while Capitalism in possession of monopoly without due compensation to the natural owners of monopoly, the people, is indefensible."

"If Capitalism will use a fraction of its facilities in a real job of engineering, fact-finding and surveying, it will discover that it is upheld, in principle by the greatest men of all ages, from Moses down, and only needs to correct errors, easily seen and eliminated, to continue its glorious career and build our capitalist civilisation bigger and finer."

A writer in an American magazine, quoting these remarks of Ingersoll, went on to say that, in other words, the peril to Capitalism lies in the fact that sundry excrescences have attached themselves to it as barnacles attach themselves to a ship, and, if not removed, finally render it unseaworthy.

Many people have come to the conclusion that the ship of "Capitalism" is already waterlogged, that it has served its purpose, and that it can no longer carry mankind forward. I do not hold that view. I believe, with Ingersoll, that the economic problem need only be treated as an engineering problem, for its errors to be self-apparent.

The most grievous error in economic thought is to include land-value and man-created improvements or machines under the one general definition of "Capital."

Failure to differentiate between land and other forms of wealth-producing property has been, and is, the fundamental error in economic or political thought, and is the reason why "non-socialists" have been unable to defend their positions against the attacks of socialists and communists.

Land Question Fundamental

Bernard Shaw says that we all discuss the X Y Z of politics without knowing our political A B C, in fact, without knowing that there is an A B C, and he commences his latest Guide to Politics by saying:—

> Suppose we begin with the Land Question. It is so fundamental that if we go wrong on it everything else will go wrong automatically.

Shaw points out that:—

> To understand the matter we must begin by grasping the fact that land is neither unlimited in quantity nor equally valuable everywhere.

and, after dealing with various aspects of the problem, he goes on to say that the crux of the land question is the classical theory of Economic Rent, but that, like the roundness of the earth, it is, unfortunately, not obvious.

Shaw wrote in regard to this law, which concentrated practically all advantages in land value:—

> It is so opposed to moral commonsense and so complicated mathematically, that I could find fifty experts in the tensor calculus more easily than five statesmen who think of the land question habitually in the terms of the law of rent . . . Our politicians cannot draw their conclusions from it . . . they simply do not know of its existence.

I do not agree that it is complicated, but I do suggest that engineers are, in this vital subject, little better informed than Shaw's politicians.

Taxation and Industry

Another subject to which engineers should give more attention is that of taxation methods.

Sir Claude Reading recently brought much criticism upon himself when he stated that we cannot finance our post-war needs by war-time financial methods. Many quite important but ill-informed people have protested, "Why not?"

Perhaps the simplest answer to the question was given by Stephen Leacock, twenty-five years ago:—

> How comes it that if war is mere destruction, it brings an apparent prosperity with it? The explanation is a perfectly simple one. War prosperity is merely the same phenomenon as that of a bee suddenly determined to eat up its store of honey; or that of a frugal man suddenly turning to a spendthrift. It means nothing else than the rapid and wasteful consumption of commodities laboriously saved. In a banker's phrase, it means living on capital. The Government takes recklessly, and spends lavishly. Everybody is either selling his labour at high wages, or selling his commodities at high prices, which, being interpreted, means that, as a result of the Government's war finance, everybody is dipping his hands deep into the supply of accumulated goods without making new ones fast enough to replace them. What looks like prosperity is in reality only ruin.

"Government has no capital of its own," said Frederick G. Crawford, President, National Association of Manufacturers, U.S.A. "Its only resources are the taxable incomes of its citizens, and the income of citizens depends upon the productivity of private enterprise. Government financial economic rehabilitation for the world can be undertaken only at the expense of the taxpayer."

This should be kept well in mind when considering any governmental project for post-war development—every project will be at the expense of the taxpayer, but *which* taxpayer?

Taxation to meet the cost of public expenditure lowers the standard of living of those who pay the taxes, and it would be unreasonable if those who received the benefits from the public works were enabled to reap excessive profits at the expense of the community.

The cost of public works is seldom shared by individual taxpayers in proportion to the benefits they receive from the construction of those works.

In fact, little attempt has ever been made by governments to relate taxation to benefit — and "ability to pay" has been generally regarded as a perfectly satisfactory and just basis for assessment.

When the total of taxation was low, perhaps this was not a very serious matter, but now that we bear the staggering burden of war, and are to face the colossal cost of reconstruction, it is imperative that very close attention be given to the economic effects of taxation.

No war industry can be put out of business by taxation — however high — but a crushing burden of taxation on industry and enterprise in times of peace, when factory output is no longer bought by government at what are really cost-plus prices, can have disastrous results in lost markets and widespread unemployment.

Who is to meet the cost of the tremendous programme of public works now being prepared? Take metropolitan arterial roads, for example — the removal of the bottlenecks that have strangled Melbourne for a hundred years. Is the cost to be met by further crushing burdens on overloaded industries which provide employment for more

than half our working population? Are they to be prevented by taxation from improving working conditions, from paying better wages, from enlarging their works, from modernising their plant, or from employing more hands? Are they to be crippled by taxation in their production costs and prevented from competing in the markets of the world?

Or is the cost to be met by those who, as owners of land, receive the very great advantages which will result from works of this nature? The Honourable Walter Nash, Finance Minister of New Zealand, now Minister to the United States, said to the American Institute of Planners in New York early last year:—

> With all the definiteness that might be required, I affirm that benefits received should be based on services rendered, and the payment should be made by that person or body which receives the service. Values should belong to those who create them. Expenditures of taxes collected from the community should be reflected in services or benefits to the *whole* of the community.

I agree with Mr. Nash, but I might point out that it is not always obvious where the real benefits go. The real profits resulting from irrigation development, for example, lie, not in the sale of water, but in the increases in business activities and in land values resulting from that development — and these increases are not by any means confined to the farmlands on which irrigation is carried out. On the contrary, they are largely in the urban areas.

Public Expenditure for Private Profit

The objective of public expenditure should not be to boost land values for the benefit of a few individuals.

President Roosevelt, when introducing to the U.S. Senate Committee a Bill dealing with the control of speculation in lands affected by the Grand Coulee Dam, in 1937, wrote:—

> *I know that you will agree with me that it is unthinkable that real-estate profits should accrue to private individuals solely because of this great Government work.*

> *Therefore, in my judgment, construction of the high dam should be dependent on the elimination of private profits, speculative or otherwise, which would result from this proposed action by the Federal Government.*

The Victorian Parliamentary Public Works Committee drew attention to this problem, and to the American Anti-Speculation Act, in a report on a developmental project in Victoria a few years ago. The Committee stated that:—

> A difficulty with all developmental works such as the proposed storage basin, is to obviate the advantages due to Governmental expenditure being reaped by landowners to the detriment of those who work the land.
>
> Landowners who sell or lease their properties at increased prices, after developmental works have added to the productive capacity, secure an unearned increment, while the new settlers secure little advantage as, having paid for the improvements in the higher prices or rentals for their holdings, they are still called upon to meet water charges.

Two years later, in 1943, the Parliamentary Committee commented again on this problem, when recommending the expenditure of more than £1,000,000 on works to provide for the irrigation of a large area of land in Gippsland.

The following comment was made:—

> The Committee again draws attention to the necessity of preventing landowners making undue profit from increased land values resulting from Governmental expenditure on public works. The unearned increment secured by the landowners is detrimental to those who work the land.
>
> The Committee again suggests that consideration might be given to enacting legislation similar to the Anti-Speculation Law of the United States of America.

The Anti-Speculation Act of the United States of America, of 1937, was designed to protect settlers in the Columbia Basin Project from speculative land

prices and to provide opportunities for many farm homes by limiting land ownership to specified maximum areas.

The act required landowners to agree to sell holdings over this limit at a fair Government-appraised price; denies water to holdings over this limit and for land sold for more than the fair Government-appraised price. The Act does not deprive any landowner of his right to buy or sell freely at any price. That is the landowner's inherent right. However, unless the landowner contracts with the Government to comply with the conditions of the Act, water cannot be supplied to him.

The problem of unearned increment in land values of irrigated land is, however, not by any means solved by legislation which gives the unearned increment to the purchaser instead of the vendor, for the purchaser will, in time, become a vendor himself, and the American Anti-Speculation Laws do not prevent him from then taking full advantage of the market price for irrigated land.

It is evident that the long-term success or failure of reconstruction in Australia will, in the long run, be determined by the policy which may be adopted for the control of land occupation and of rights in land values. In this regard, rural land cannot be dealt with as a separate problem from urban land, in which are concentrated by far the greater part of the land values created by the whole community.

I am of the opinion that there can never be proper use of urban lands or stability in rural industries while landholders have any equity in unearned increment, i.e., in increases in land values arising out of pressure of population or from public works. Unearned increment should go to the whole community, and it can be taken either by nationalising the land — as was done by revolution in Russia — or by the peaceful democratic means of taxation.

A uniform tax on land values equal to its rental value unimproved, i.e., its "economic rent," would eliminate speculation altogether, and the revenue received by the

State would enable taxation on industry and on earned incomes to be very greatly reduced. If industrialists and wage-earners realised this, the reform would be effected very quickly indeed.

It is essential for the community to re-think its attitude towards public expenditure on developmental works, and to decide whether it can afford to subsidise such works largely for the benefit of the limited section of the community which receives practically the whole benefit in unearned increment.

Unearned fortunes are made only at the expense of the community.

Is the post-war programme to follow the pre-war practice which might well be labelled "Public Expenditure for Private Profit," or are we going to do some straight thinking on this question of the "Land Problem"?

State Development Tax

A suggestion with a good deal of merit has been made that would go part of the way towards the collection of unearned increment for the community. It is that capital liabilities in regard to all state developmental works — past and future — might, with advantage, be grouped in a single account to be known as the *State Development Account* — with, of course, appropriate subdivisions for the various activities such as Water Conservation, Roads, Railways, Regional Planning, Soil Conservation, etc. — and that interest charges might well be met from a special land value tax designed to distribute as equitably as possible the cost of developmental works over the owners of properties benefiting both directly and indirectly from the works.

If all developmental works were included in the proposal, then a uniform tax on land values, without graduation and without exemption, would effect the fairest distribution of cost. Such a tax would be very properly called the *State Development Tax.*

It would be simple to assess, and impossible to evade. It would not penalise industry or increase the cost of living, but it would reduce land speculation and it would

transfer a good deal of the burden of taxation from rural industries and farms, and suburban industries, where land values are relatively low, to the cities where land values go to thousands of pounds per foot frontage, or hundreds of thousands of pounds per acre.

The tax would be paid by the owners of lands as owners, and not by the industrialists or business men renting property.

Sir John Grey, Prime Minister of New Zealand, said many years ago:—

> It is perfectly just that land improved by public works, and increased in value by the competition for land arising from a dense population, should bear a share of taxation.

The levying of a State Development Tax would, of course, involve the abolition of the present Land Tax, and also the reduction of other forms of State rates and taxes, including water rates, rail freights, motor registration fees, etc., to the extent that they provide for interest on capital expenditure.

The outstanding advantage of a *State Development Tax* on land values is that revenue from the tax would automatically expand to meet the increasing cost of financing new development works, expenditure on which, if they were truly developmental and reproductive, would be reflected in increases in land values in town and country, at least equal to the total expenditure.

Conclusion

In endeavouring to direct the attention of members of The Institution tonight towards the study of economic principles with which I believe all engineers should be familiar, I have commented very briefly on Production and Distribution, Social Credit, Machinery and Employment, Benefits of Scientific Discoveries and Engineering Inventions, Land Values and Unearned Increment, Land Speculation and Housing, Farming Instability, Capitalism, Taxation of Industry, and Public Expenditure on Developmental Works.

I believe that these are not disconnected problems—I believe that they would not be problems at all for very long if it were recognised that there are, underlying and governing the economic life of the community, simple unvarying natural laws which cannot be flouted or ignored.

The often referred to "Poverty in the Midst of Progress" is simply the consequence of our refusal to recognise these natural laws, and plan our economic and social life accordingly.

"In Nature," someone has rightly said, "there are no rewards and no punishments; there are only consequences."

Engineers do not question the fairness or unfairness of the law of gravitation or of the laws that govern electrical phenomena. They do not ignore these laws nor attempt to deny their existence. They endeavour to understand them, and design their structures and their machines to take advantage of what they know will be inevitable.

I believe that if this were our attitude to economic problems, there would soon be little unemployment and no undeserved poverty; there would be amazingly rapid material progress in all industries throughout the community, but there would be no great accumulations of wealth by individuals who had not earned it by service to the community.

I believe that there is nothing to be ashamed of in profits that are a return for service, and I believe that Capitalism, cleansed of monopolistic barnacles whose growth is allowed by our present laws and which act to restrict rather than to expand production, offers the true "New Order" that so many claim to seek.

A British engineering journal recently drew attention to the fact that increasing numbers of people, who vaguely profess liberty, believe it to be no longer possible, and, to obtain freedom from want, are prepared to accept throughout their lives the regimentation and bureaucracy of socialism. I do not hold that view, nor do I believe that the surrender of liberty to the State is necessary or desirable.

I believe that the world provides all the resources necessary to satisfy the material desires of all men, and that our failure to take advantage of these resources to the limit of human ingenuity — our failure to distribute equitably even the benefits of our present restricted and handicapped industrial and community effort, and our failure to solve the so-called problem of under-consumption — is due to our failure, as Bernard Shaw points out, to recognise the "Land Question" as fundamental.

We have gone wrong on the Land Question, and everything else has gone wrong automatically.

I believe that there is no greater or more urgent task of leadership for the engineer than to help the community to a clear understanding of the simple economic laws that govern the distribution of benefits from human activities.

"Until there is correct thought, there cannot be right action. When there is correct thought, right action will follow."

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