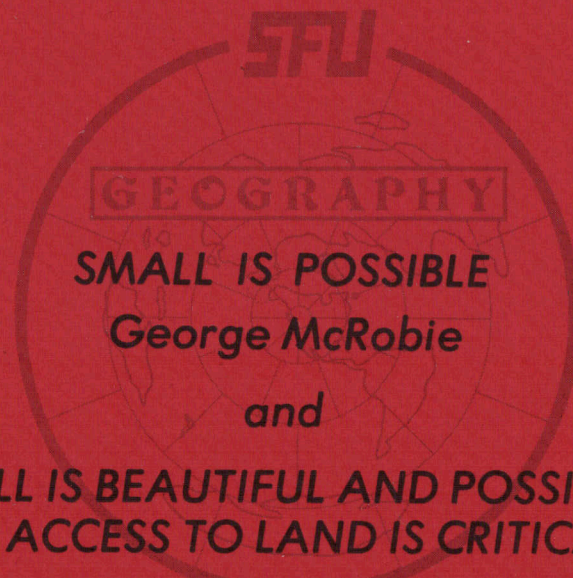


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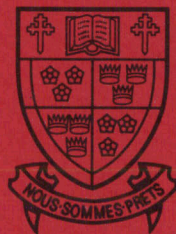
SMALL IS POSSIBLE

George McRobie

and

**SMALL IS BEAUTIFUL AND POSSIBLE
BUT ACCESS TO LAND IS CRITICAL**

Robert A. Williams



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UNIVERSITY**

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Discussion Paper No. 15

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Comments are invited.

PREFACE

On April 29 1982 George McRobie visited Simon Fraser University to deliver a lecture on his favourite topic - "appropriate" technology. To give special point to that occasion and underline the relevance of the topic for British Columbia Robert Williams was invited to give a counterpoint talk. This Siamese-twin paper is the result of that juxtaposition.

George McRobie spent some fifteen years with the National Coal Board in Britain, during which he was closely associated with E.F. Schumacher, author of Small is beautiful. In 1965 they founded the Intermediate Technology Development Group in London, U.K., of which Mr. McRobie is now chairman. A graduate in economics of the London School of Economics Mr. McRobie is the author of Small is Possible.

Robert A. Williams is best known in British Columbia for his political activities, especially as Minister of Lands, Forests and Water Resources in the NDP government from 1972 to 1975. Having degrees in economics and urban planning from the University of British Columbia he has a special interest in land issues.

Jim Wilson
Guest Editor

SMALL IS POSSIBLE*

George McRobie

* We regret that it has not been possible to reproduce here all the illustrations used by Mr. McRobie in his actual lecture.

When Schumacher and I started the Intermediate Technology Group in 1965 we did so on the basis of our experience that overseas aid and development were failing in their purpose because they were bypassing the majority of the people in the developing countries. And what aid was in fact becoming manifest was becoming manifest mainly in the cities. We were bypassing the poor rural areas where 80 percent of the population live, and concentrating development in the cities, thereby aggravating the problems of the dual society - the very rich elites and the very poor in the rural areas. We also argued that the big capital-intensive industry of the west is not culturally neutral; it is loaded with the culture of the country that produces it. Therefore the more large scale capital-intensive industries were introduced into developing countries, the more their original cultures were being destroyed, and the western culture - if that is the right word, for the culture of western industrialisation is largely one of force - was taking its place.

A friend of mine used to collect cases of inappropriate technology and one he collected some years ago was called the 'plastic sandals case'. In this case West Germany gave a present of a plastic sandal factory to Egypt in the 1950s on the grounds that plastic sandals could be made more cheaply than leather sandals in the market place. And this was true. They set up the factory and the first thing they found was that the factory employed about 300 people but put out of work 5,000 people who had formerly made leather sandals in that area. In a traditional society the unemployed have nowhere else to go except into the cities, entering the so-called service sector, mainly consisting of begging, trying to clean other people's shoes or opening the doors of the cars of visiting United Nations experts who come to tell them about unemployment. The next bit of bad news they discovered was that the materials for the plastic sandals had to be imported; that wasn't a gift and would be imported from guess where - Germany. So there was a strain on the balance of payments that hadn't existed before. And then finally they found that when plastic sandals break you can't mend them; you have

to throw them away. So the total expenditure on footwear went up instead of down. The developing world is full of plastic sandal factories, so to speak. Most of the big industries we introduce destroy something that the people are already trying to do in the rural areas, and put nothing in its place in terms of productive employment because our industries are deliberately designed to be labour-saving and capital-intensive.

So we argued that the developing world needed a new kind of technology. We called it "intermediate" because in terms of complexity, cost and size it would lie somewhere between the sickle and the combine harvester, between the hoe and the tractor. Over the past fifteen years we have been developing such technologies and introducing them in poor countries and poor communities. Essentially we were aiming for technologies which were small so that they can fit into small markets in rural areas; relatively simple so that they can be owned, operated and maintained by people without highly sophisticated skills; capital-saving rather than labour saving; and non-violent toward people and the environment. You will have noticed immediately that these are the exact opposite of the characteristics of modern industrialisation. Our technologies are very big, beyond the reach of most people to own or operate; they are not simple but very complex, which again places them beyond the reach of the great majority of people; they are very capital-intensive and energy-intensive and many of them becoming more so; and they are singularly violent towards people and towards the environment.

In spite of the fact that these intermediate technologies have the opposite characteristics of conventional technology, over the past fifteen years we have been able to help to develop some twenty intermediate technology groups in different parts of the world, and other groups have been formed in the United States, Germany and Holland. Their aim is to direct aid increasingly towards self-help rather than handing out money or selling people inappropriate large-scale hardware. Within a few years of our formation I found myself invited to an extremely interesting meeting at Memorial University in Newfoundland which was

the first group of people to bring together the poorer areas of rich countries, areas such as Canada's middle north and eastern seaboard, the Appalachian mountains, the states of southern Italy, the Western Isles of Scotland, north Norway and north Sweden, Greenland and many islands throughout the world. All of these have one thing in common; they are on the peripheries of rich metropolitan societies, and there seems to be an Iron Law of Keynesian economics that the more prosperous the center becomes, the more these peripheral areas are denuded of people and raw materials. At this conference people stood up time after time and said what we have been told by the mainstream of society is, if you want to live out there, live on welfare; if you want to enter the mainstream of society, come into the cities. But this has already started creating its own problems because the cities, it is now quite clear, are energy sinks into which we pour vast quantities of energy, apart from being societies which even in the relatively short run are unsustainable and have lost any sense of values other than purely urban and industrial ones of a very special kind. Anyway, from that meeting we began to be increasingly invited by people like the Navajos in New Mexico and from as far away as Tasmania to suggest types of technology that might enable small communities to revive. Here we are not talking of going back to some 19th Century primitivism but simply saying can we not use the best intelligence we have, the best scientists and the best technologists, to make things smaller and more on the human scale instead of ever bigger and more complex and people-excluding. From there it was not a major jump to realise that it wasn't only the underdeveloped countries, nor the poor areas of rich countries, that needed a new approach to technology. It was the rich countries themselves.

In fact they need a new technology perhaps more urgently than do countries such as India and Africa because the latter still have most of their options open. We don't. We are already fairly well down a road on which we cannot continue for long. We are creating a non-sustainable economy. Let me say a couple of words on that.

I would distinguish three reasons why our present industrial structure is not in all its aspects sustainable. They come under the category of human, environmental and resource reasons. More and more in the past seventy years, particularly the last fifty, industrial society has concentrated on labour saving. We have said to our engineers, capital and energy are almost free goods, so throw these at the problem; the problem is how to save labour. In the process we have created an industrial machine that increasingly eliminates the human factor. People are troublesome; they demand rights, holidays, more money and things like this. Machines don't. In fact the ideal of the owners of industry has become production without employment, and they get very upset when a large section of the working population says well our ideal is income without work. Whichever way that goes it doesn't go toward creating a harmonious society. Also by concentrating on labour-saving we have created a de-skilled society - there has been a steady process of deskilling over the past fifty years. Furthermore the skills that people do have are useful only within the system, so that if the system starts breaking down these skills-such as they are, and they are not many - become totally useless. So the reverse side of a very high material standard of living has been perhaps the most helpless society in the history of mankind - far more helpless than the Indian or African peasants because they can live on a hundred dollars a year and at least feed themselves.

There are many other aspects of the human problems of industry which time doesn't allow me to dwell on, but let me give you a few headings. We need to start looking very carefully at human ecology. We look at the ecology of natural systems but we very seldom say what we are doing to people. Is it really true that work is a "disutility", as the economists continue to tell us, which really is a chore and you want to do as little of it as possible and get remunerated more and more the duller the work becomes? And not only have we made work very dull for the great majority of people in the country, but when they demand more compensation to make up for the dullness we have one of the most potent causes of inflation, while we go looking around for other demons such as expenditures by

government. Or is it possible that work has a function that we have lost sight of - but certainly the great philosophies never lost sight of - the function of socialising people? It enables people to work as groups and to become social animals and not simply competing individuals. Secondly, of course, it enables us to produce goods and services that we need, and thirdly to bring out the creative skill that exists in every human being. If we took that view of work, production would become almost a by-product of human activity, but at present we concentrate on production, and the human costs are the by-product.

Given a system such as we have had for the last fifty years which concentrates on eliminating people from the processes of production, when the system slows down there can only be one result - unemployment. I don't know about Canada but the argument going on in Britain now is not whether we will ever get back to full employment; people have stopped talking about that. They are now talking about whether our economy will reach equilibrium with three million unemployed or five million. In social terms this must be one of the biggest disasters to hit the west for the past two or three hundred years. We need to look at this. We need to look at the work itself; we need to look at the social organisation of work, what sort of units and institutions people enjoy working in, where you are likely to develop their skills and creativities. They will certainly not be huge institutions where people are simply numbers. They are very much more likely to be organisations where the workers own and control the production: worker-owned units, co-operatives, joint ventures, public or private, a whole spectrum of activities rather than only large-scale private industry whose sole objective is to maximise profit for private appropriation.

Another thing we need to look at is the geographical distribution of work. Do we really want it all to be concentrated in cities or do we want it more widely distributed? There are many reasons for having it more widely distributed, not least the future problems of energy and transport costs. And we really need to realise that the whole of our society has

been based on one thing - cheap energy. And that has enabled us to substitute capital and energy for human beings in agriculture and to concentrate these human beings in cities which are growing ever larger and more complex and more difficult to manage. In that society, a purely urban society, we lose sight of agriculture as an activity which has anything other than the task of producing the cheapest food possible. Agriculture, like industry, also has secondary purposes. One of its purposes might be to maintain the water table relatively pure; another to maintain some sort of community; a third to maintain the soil in good condition for future generations; a fourth to maintain genetic variety. All these secondary functions of agriculture are lost sight of by a highly organised society that believes the only purpose of agriculture is to produce cheap food, and if it happens to become -as it has - the greatest single user of poisons in the process, well you know, you win some and you lose some. You will lose a hell of a lot. Furthermore we believe we are exporting food. But we are not exporting food; we are exporting oil and top soil - or rather Canada is, for Britain is not a major food exporter. In this non-sustainable system three units of oil are used for every unit of energy that is exported in the form of food.

So our system is non-sustainable from the human point of view; it is non-sustainable from the resource point of view; and it is certainly non-sustainable from the environmental point of view. But further than that we have to ask what sort of violence we are prepared to accept in order to maintain the system: the unspeakable violence of nuclear power, where we cheerfully say we will hand over to the next generation problems that we haven't the faintest idea how to solve ourselves? This really qualifies only for the robust view of the American humorist who said "Why the hell should we worry about the next generation? What have they ever done for us?" Maybe we will be the first generation to say this if we adopt nuclear power as a major source of energy, not to mention using vast quantities of herbicides, pesticides and insecticides in agriculture. Being interested in this subject I go around asking people, scientists particularly, how much of this poison is taken up by the plant and absorbed by us, and what happens to us when we absorb it. And so little is known about this.

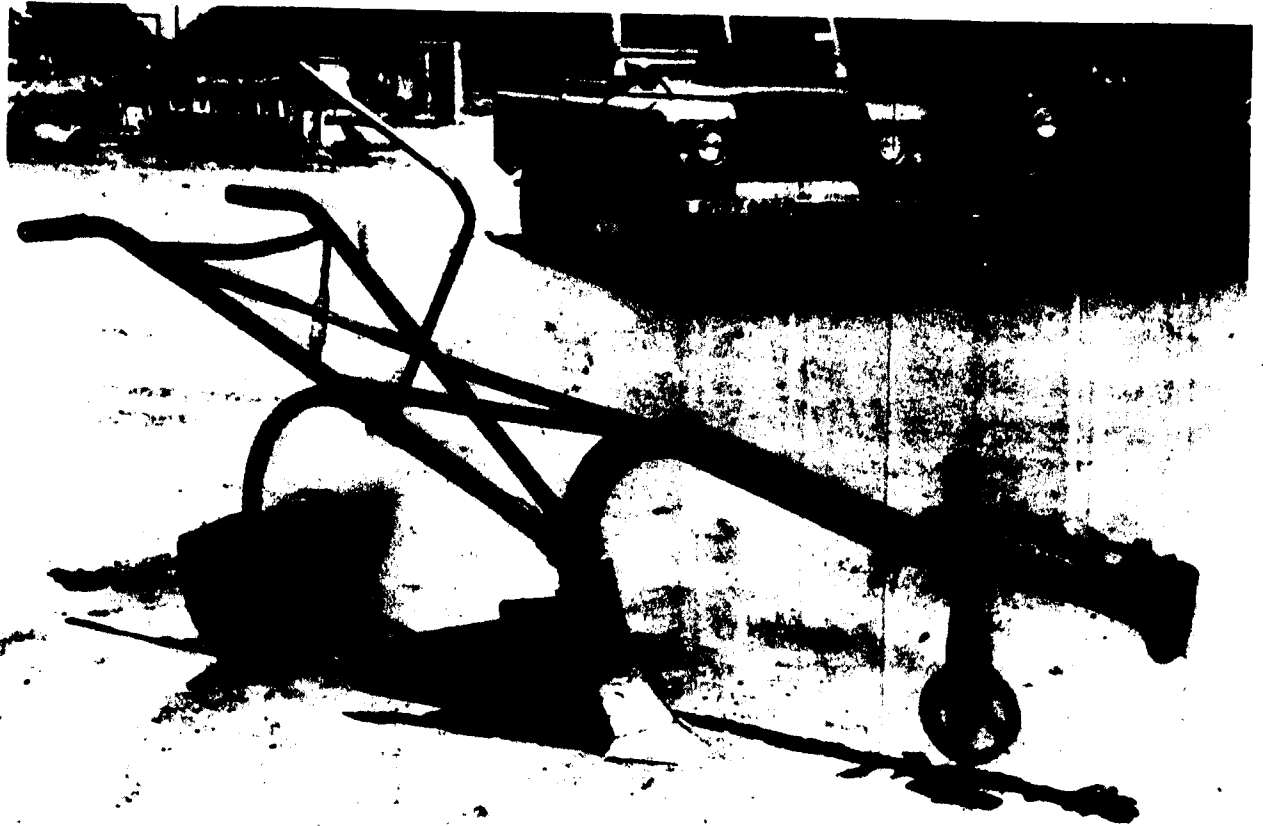
Quite extraordinary! Someday I will meet some group of people who will say, "Yes, we have studied this very carefully." I always hope it might be the food industry but it never is. But what we are doing to ourselves in the name of cheap food and agriculture based on chemicals is quite alarming.

So from all three viewpoints - human, environmental and resource - we need to start looking very hard at our technology, looking especially for something smaller. Technically we can do almost anything. We can make technology big, small, medium or any other way we like. We have been hoodwinked into believing it can only become bigger, more complex and more concentrated. What I am arguing is that there is a place for a technology which is smaller and certainly capital-saving and energy-saving because capital and energy are going to become increasingly scarce. And assuredly we need technologies that are non-violent towards people and toward the environment.

Here I will run through a few examples which, however, cover a fair spectrum of applications - agriculture, transportation, building, energy and industry. Over the past fifteen years we have been developing technologies with these characteristics - small, simple, capital saving, non-violent and we know it can be done. I am not asking you to believe that many of these technologies that I will show you have application in our own society. What I am illustrating is the principle that if you turn first class engineering talent onto the question of capital-saving you can produce very useful and very interesting results.

First a very simple example - a plough with a ridging attachment on it. I used this simply to illustrate the fact that agriculture is a localised activity and the minute you get away from enormous machines which take no account of local conditions you have got to think in terms of local production for local use.

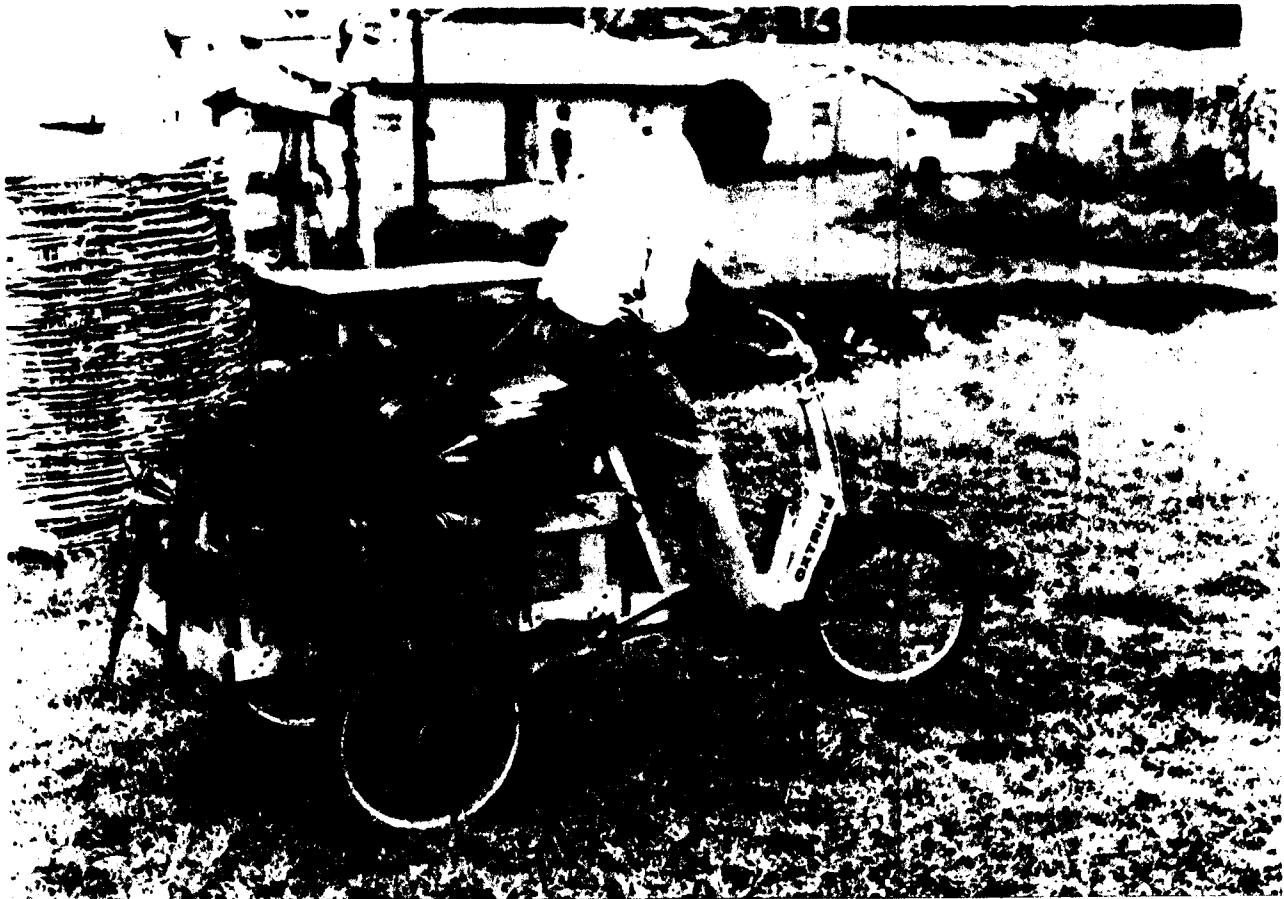
A similar example of our work (not illustrated) is a seeder manufactured locally and very widely used in the developing world. This helps to move agriculture in developing countries towards planting in rows so that you can intercrop and step up efficiency.



A Tie Ridger attached to a Ridging Plough:
the Intermediate Technology Workshops,
Mangoye, Zambia.

A second very simple technology — an upgraded tricycle using materials that can often be produced locally, and using a load device that can be changed for carrying loads or passengers or anything else. We are having this tested out in Nairobi.

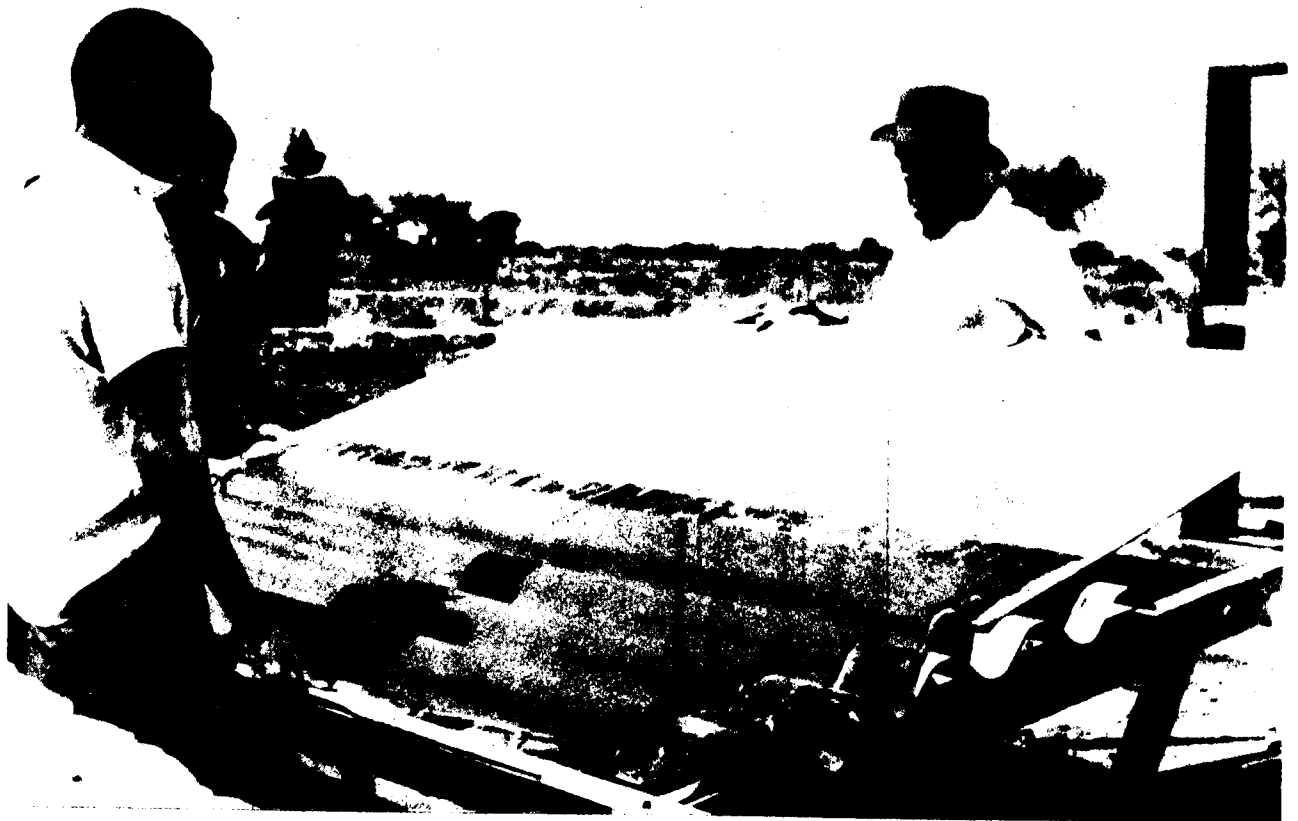
Another form of rural transport we developed (not illustrated) consists of ferrocement boats on the Nile carrying 20 tons of goods or people in an area where there are no transport facilities whatsoever. There are now about 25 of these chugging up and down the Nile.



The "Oxtrike"; designed for local manufacture, this low-cost vehicle is safer, stronger and easier to handle than traditional cycle rickshaws.

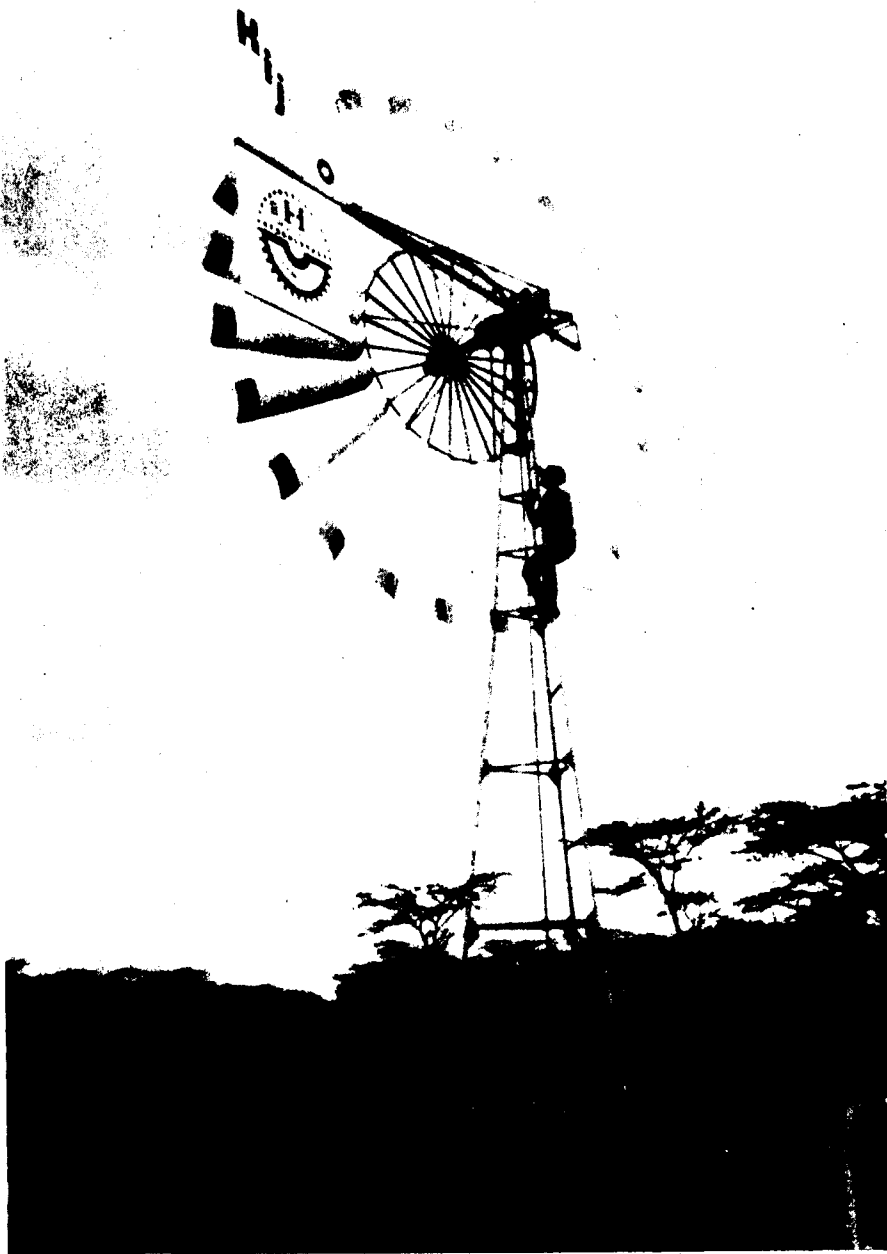
Now let me mention a very interesting building technique (not illustrated) which, by the way, we are going to start using in Britain quite soon. This consists of sun dried bricks, double thickness, using a very thin mixture of cement or mostly clay for supporting the bricks. Outside the bricks we then put a skin of fibre reinforced cement, making a building which is very stable up to at least two stories high. It has extraordinary qualities of thermal efficiency and costs a fraction of the cost of building with fired bricks, mainly because we have cut out all energy except solar energy. We have got some tests going now and have calculated that financial cost is one-half of the cost of building a conventional wall and the energy cost is one-fifth of conventional building - so I reckon we will be using this technique quite widely soon in Britain.

We promote other building materials made in similar ways. Shown are fibre-reinforced cement roofing sheets being made on site - concentrating on site-manufactured building materials to eliminate transport costs.



Fibre-reinforced cement roofing sheet being manufactured in Botswana

Now we come to different technology - wind power. A work shop in Kenya, Kenyan owned, making windmills that we designed specifically to compete with three-to-five horsepower diesel pumps, and compete they do very well. We redesigned the blades, the transmission system and the pump to upgrade the windmill to make it very competitive with diesel power. These machines can pump from as deep as 750 feet or just a few, depending on the number of blades you put on.



The "Kijito", ITDG-designed wind pump, locally manufactured in Kenya.

A very similar example (not illustrated) which will probably be very widely used in our own countries is the river turbine. I showed this to the new government in Manitoba and before I had got back to my hotel they were already phoning up our office asking for plans and drawings of this piece of equipment. Some of our lads who were working on vertical-axis windmills had decided that it might be useful if we put the "windmill" under water to see if it would also generate power, and that is what they did. They tested it out on the Thames first and it worked very nicely. So it is now being tested out in Juba in the Sudan. A three foot diameter river turbine of this kind produces the same power as would be produced by a 60 foot diameter undershot water wheel - the big ones. An immense amount of power can be generated this way. The Dutch are financing this particular venture. The British government looked at it and said there is nothing in it: the not-invented-here syndrome - they hadn't invented it so it can't be any good.

In that same field we have an interesting case of modern technology making something small. The limiting factor on the size of small scale hydro used to be an enormous governor which governed the flow of water into the turbine. It cost about five thousand pounds, even a small one. So we have developed a small controller, not illustrated, which controls not the flow of water but the output of electricity, keeping the load steady, eliminates the governor and costs one hundred pounds. So immediately the scope for small scale hydro expands vastly because you have cut out the main item of equipment cost - much of the rest of the cost (in civil construction) can be done locally with voluntary labour. These are now being tested out in about six different countries.

Another example of our small-scale technology is (not illustrated) a mini-pulp-making machine for producing egg trays - the big square ones, not the little fold-over ones. When we started this work we went to a very big sugar-manufacturing company in Denmark, based there, I believe, for reasons of what Galbraith called creative accounting. They said the smallest machine we make costs one-quarter of a million pounds and makes a million egg trays a month. We said that would cover Zambia, the country that needed it, in egg trays in a matter of a few months, which is not quite what we had in mind. What we want is a machine that makes a quarter of a million egg trays a year. They said technically and economically absolutely out of the question; can't be done. With the assistance of Reading University and a small company in Britain we produced one

within about a year. There are now fifty of them in operation in developing countries.

Next we have the example of a small-scale industry in India - sugar. Instead of one big sugar plant you can get forty small ones. The problem was to upgrade these small ones to make them as technically efficient as the big plant. This is now within reach. The screw press introduced them to the small scale sugar factory and improved its efficiency by about 5 percent. Also by introducing an improved form of furnace we altered the energy consumption from a condition where all the bagasse was burned plus 20 percent more in the form of firewood (which is very short in developing countries) to a 20 percent surplus of bagasse. But bagasse happens to be an excellent raw material for manufacturing paper. So you could have say twenty of these little sugar factories dotted around the country where they fit into the agricultural economy and all feeding the paper plant. Again the process of bringing industry into the rural areas and starting the process of capital accumulation and income generation there.

Similarly we are interested in small-scale cement plants. Conventional cement plants now run at about 3,000 to 4,000 tons a day and there are very few deposits big enough to support such plants. There are enormous transport costs between the plant and its customers. Now there is a plant in India which should be starting next month, producing 20 tons a day and supplying the local region, which will immediately cut out the 20 percent of the cost devoted to transportation. It also used a more efficient form of heat transfer. This kiln is not a new technology. It was developed in Germany during the war so that they could have a lot of small cement plants instead of two or three big ones which could easily be bombed out. The Germans used to run it about 400 tons a day, but nobody had ever brought it down to 20 tons a day.

That's it. I simply give these examples to illustrate the fact that small is possible. Some of these we can adapt for ourselves; mostly we will have to develop similar technologies to suit our own conditions. I believe that the sooner we start the better, not least because of the political implications of going along the road that we are now going on. The concentration of economic power represented by modern technology means a concentration of



Construction of a shell furnace in India for the utilization of bagasse (sugar cane fibre) as fuel in small-scale, open-pan-sulphitation sugar processing.

political power that is perfectly capable of taking us into an authoritarian society. If we don't believe in an authoritarian society we need to start trying to redistribute economic power, distributing it as widely as possible to communities, to groups, to individuals. I am not saying we need to do away with the big stuff altogether. What we need to say is let's discover what must be big, what can be small.

SMALL IS BEAUTIFUL AND POSSIBLE...
BUT ACCESS TO LAND IS CRITICAL

Robert A. Williams

SMALL IS BEAUTIFUL AND POSSIBLE...BUT ACCESS TO LAND IS CRITICAL

I am one who has enjoyed both McRobie's and Schumacher's work over the years, and I am most impressed by the challenge McRobie put to us at the end of his talk - that "the concentration of economic power represented by modern technology means a concentration of political power that is perfectly capable of taking us into an authoritarian society." He argued that along with an intermediate technology we should be trying to redistribute economic power as widely as possible; to communities, to groups, to individuals. I couldn't agree more - and we need the power of the state to achieve that goal.

But the goal that Mr. McRobie shares with many of us is very difficult to achieve in British Columbia because we have a land tenure system that does not allow us to share our land base in a way that could be called equitable. And, no different than many parts of the Third World, most of our lands in this land-rich province are controlled by a handful of corporations. That means that economic power is overly concentrated among those who control that land. And if Mr. McRobie is right, that means excessive political power lies there as well.

In British Columbia 95% of our land is in nominal public ownership. However most of those lands have been allocated under complex licensing rules to a relatively few forest corporations. In the Interior and North of British Columbia, ten companies alone control 52.7% of the cutting rights in the forests and the next ten companies control 19.4%. Thus, twenty companies in the Interior of B.C. control 72.1% of the forest lands in that region. In the coastal region of the province, the problem is even more severe. The first ten corporations on the coast control 85.7% of the allowable cut. The figures I have used are not quite up to date - they are from the Pearse Royal Commission Report of 1976. Since then, two of those ten companies on the coast have disappeared - Rayonier, which had 10.5% of the coastal cut, and Bay Forest Products, which had 2.8%. Eurocan which had 3.6% of the wood on the coast is now being swallowed up by an interior company. So today, some eight companies control our coastal forest lands.

This growing concentration and control means that we are closing off freedom of choice on a massive scale. It means that the scale of operations tends to be very large, and it frequently means that we close off the possibility of different types of land management. And it generally means

that intensive management of our lands simply doesn't happen. Fritz Schumacher was one who loved to husband the land. Given the scale of ownership and control that now apply to our forest sector, that husbanding is not really feasible.

It has been said that our forests in B.C. represent 50% of the economic activity of the province. The figures I have presented regarding the growing concentration within our main industry indicate how serious the problem of controlling our own destiny has become. What we have is a system that is more and more capital-intensive and less and less labor-intensive. Thus our major industry now lacks a human scale. Our sawmills are getting bigger, our pulpmills are getting bigger, our land management decisions are becoming more centralized and bureaucratized. Our forest economy more and more is a system where decision-making is made outside the affected region. Thus, the whole "modern" direction of our economy here on the West Coast of North America, is just the opposite of that which McRobie and Schumacher have argued for in the past decade. As Mr. McRobie said at another lecture recently, we might at least begin to move in his direction if only to provide us with some "lifeboat" alternatives, now that we appear to be on the edge of industrial collapse.

In British Columbia, I am sorry to say, we not only have a land tenure system that does not allow individuals, communities, or regions to make decisions; we have a system that is violent (to use Schumacher's term) with respect to the land itself. We do not have to travel very far from Vancouver to see that violence in terms of massive clearcuts of forest lands and abuse of wildlife or fisheries habitat in logging areas. And if we travel further - to the magnificent Queen Charlotte Islands or parts of the Selkirks, Monashee or Rocky Mountain ranges, then all too frequently the violence against the land is even more severe. Part of this violence is, I think attributable to the lack of settlement and community within some of these regions. We have a kind of "cannibal" resource consumption pattern in the province - where we move the raw materials from the upper and central coast down to processing plants in Vancouver and the Southern coast. This lack of settlement and community in the resource regions allows big government and big corporations to be more irresponsible and uncaring in terms of land management. In a sense, the land tenure system corrupts us in this way as well.

In a broader sense, in this province we have a frozen settlement pattern - one which has not significantly changed since the turn of the century. We have accepted the settlement pattern of those earlier days, along some of the main valley systems of the province, and then applied this tight forest tenure system which has been like a strait jacket in that no settlement has been allowed to occur within it. One need only look at Vancouver Island to see the two very different parts of our settlement system. The southeast third of that huge island is very, very different than the remainder. Its settlements are scattered, with many rural settlements and regional towns, plus our capital region and the growing hub of Nanaimo. It is a pluralistic, diverse region with a tenure system that allows a wide range of ownership. The remainder of the Island however is tied up with this strange forest tenure pattern of ours. A few companies like MacMillan Bloedel, Canadian Forest Products, Tahsis and Crown Zellerbach dominate. It means that virtually no farming takes place in the Northern half of the Island. It means that settlement is frequently limited to bunkhouses and logging camps or company towns like Gold River and Port Alice, or quasi-company towns like Port Hardy and Port MacNeil. Just thinking about the options we've closed off in that region is frightening. The farming option is closed, the commercial recreation option is closed, and of course the private or small-scale forestry option is close. It's a wonder that we are as well off as we are! Only the rich could be so wasteful! And that regional story on Vancouver Island can be repeated to varying degrees in the other regions of the province as well.

The most recent example on Northern Vancouver Island where settlement has been frustrated is the community of Nimpkish. The owner of the Tree Farm Licence that surrounds this small community on Nimpkish Lake is Canadian Forest Products. Nimpkish has been a company-owned village for the past thirty or forty years and was to be phased out by the company. The company told the people of the community that they could live in Port MacNeil, some 35 miles to the north. It has been a mammoth job for the residents of this tiny community to try to reverse this corporate decision. Fortunately, the residents have proven to be politically adept and their Regional District director who lives there has exploited the situation masterfully. This example, where success now seems within their grasp, is a rare one. Keep in mind however, that this is an existing village, with people who have become skilfull at

dealing with a complex political and administrative problem. Such action would be impossible where a village did not already exist, or where there was little political know-how.

Now the people of that community are looking at the possibility of small-scale hydro development nearby... and might very well end up selling energy to the corporation that tried to oust them. That kind of creativity would probably have been lost were the village not in place and accustomed to thinking about its problems (and opportunities) in a lively way. It is this "void" in the province's hinterland which is so disturbing. It means that the collective genius ... the hearts, minds and the labour of our people ... is not being applied to the problems and opportunities of our diverse regions. The loss in terms of our potential must be massive.

I believe that the opposition to settlement lies not just in the traditional push toward control of more of the elements of production on the part of the corporations in this sector. It is more than a drive toward regional monopoly control of the forest base; the other underlying reason for fighting a more diverse or pluralistic settlement pattern is the demands which would follow from the settlers ... that, I suspect, is the great fear. The new demands for services would automatically create a need for increased revenues, and the most obvious place to obtain those revenues would be from the forest land base in the form of economic rent. Such a drive on the part of the citizens to collect rent may be the greatest fear the corporations have. Nevertheless rent collection by the public or local community would work in many ways ... it would push the company to become more efficient and would provide new revenues at the local level to enhance living near the wilderness. Both implications are rather exciting and should not be feared at all.

In another place Mr. McRobie has suggested that there may be a case for taxing capital, rather than labour, in order to redirect ourselves in a less capital-intensive direction. That strikes me as a fascinating argument which may be valid. But there may be even more of an argument for taxing the forest land resource base of the province. This land base has been allocated, without charge, by the Crown and the value received for the wood is clearly less than market value, as we've seen in studies by Professor David Haley of the U.B.C. forestry faculty and others. This loss of public

revenues allows the corporations to be less efficient and less inventive, without any penalties. Collecting the rental value of the land or resource would push them to greater efficiencies or cause them to give up their lands - or parts of them - to others. Either result would be beneficial for the public. So while Mr. McRobie's suggestion of taxing capital is interesting - in British Columbia I would suggest there is a stronger initial case for taxing the land and collecting economic rents. The more diverse arrangements that might follow in terms of tenure might then best be along the lines that R.H. Tawney suggested in An Acquisitive Society, which were endorsed by Schumacher in his book.

Alternative management and ownership systems unfortunately do not abound in British Columbia. The best alternative proposal that I am aware of is that prepared by the residents of the Slovan Valley in 1974. The Slovan Valley Management Study provided the most thoughtful analysis of the economy and land tenure system which I have yet seen in this province. But beyond that, this handful of people - many of them American objectors to the Viet Nam war, and many of the others second and third generation Doukhobors - proposed taking their valley in an entirely different social and economic direction. They proposed transferring all the Crown forest lands to the people living in the valley. They wanted to elect their own resource management "government" locally, within the valley. And they wanted to hire their own staff and end the pattern of absentee bureaucrats and absentee corporations who have dominated decision-making in their community in recent decades. They developed new ideas about the scale of milling, the degree of processing, and the use of woods that had hitherto been waste. And, equally important, they developed ideas about intensive management of the resource by individuals, families, co-ops, and the region itself. The range of ideas was entirely in keeping with the ethic which Schumacher had enunciated.

Another good example of local control and management exists here in the Fraser Valley in the form of the Mission Municipal Tree Farm. There the lands are managed by the local community to good effect. Reforestation takes place on 95% of the cut lands...a record not equalled by the provincial government or large corporations anywhere else in the province. The people in Mission have excelled in several ways; for example, they have developed seedlings of species not commercially produced in the past and have involved school children in reforestation. I am afraid that we have already proven in our province that neither big corporations nor big governments manage the land

well enough. The new directions shown by the people of the Slocan and Mission may be the only realistic hope of ending the violence against the land that is now so prevalent, and giving opportunities to individuals to develop their own skills in a caring way, within their local environment.

The N.D.P. administration in this province experimented in other ways in the form of greater local participation in economic decision-making, for example with worker-directors on the board of Kootenay Forest Products in Nelson, which was a success. We also experimented with native Indian ownership and participation in a joint venture with the Burns Lake Native Development Corporation in the Northwestern corner of the province. That too has worked well. And we also experimented with Community Resource Boards in the cities, in terms of social policy in the neighbourhoods, to good effect. But these areas of local control are all too rare.

Unfortunately, measured by Schumacher standards our large Crown Corporations have by and large been failures. Our huge gas and electric utility, B.C. Hydro remains capital-intensive, and adheres to a rate structure that encourages waste by its major consumer, the forest industry. They thus discourage the massive use of wood waste, which could be a major source. They have barely begun to think about co-generation of electricity by the forest industry, yet such co-generation would put thousands of people to work in picking up waste wood left over as logging debris. Our electrical utility flies in the face of everything Mr. McRobie has been calling for. It is not too unlike the central generating utility in Britain which he referred to recently as the "Atmospheric Heating Corporation" because it is only 32% efficient, the rest of the energy going to heat the atmosphere. B.C. Hydro is comparable in its own way on its own scale. Another of our Crown corporations, B.C. Rail is not just an energy sinkhole, but a capital sinkhole as well.

All of this means that we have great challenges in British Columbia in terms of the reforms Mr. McRobie is asking for. There is a great need to reform the corporate structure that still dominates decision-making in the province; there is a great need for changing the ownership system, and our resource rent collection system; and there is of course a great need to move toward an intermediate technology. The goals he talks of can only be achieved once we open up our land resources to all so that our people can use their talents more fully. Once that is done I suspect our own genius will lead us to a technology and scale that truly have a human face.

