Patterns of Human Settlement

BY ERNST FRIEDRICH SCHUMACHER

During the last hundred years the pattern of human settlement has developed towards "megalopolis" in the one hand and "vast emptiness" on the other. The availability of cheap and plentiful fossil fuel has made this possible, writes E F Schumacher. He points out that the present pattern may have to change, and that this change will require a change in technology

World population reached its first thousand million in 1850; its second thousand million about eighty years later, in 1930; its third thousand million about thirty years later, in 1960; and is expected to reach its fourth thousand million in 1976, a mere 16 years later. Demographers reckon with the addition of a further 3 thousand million people during the remainder of this century; of these 3 thousand million, 2.5 thousand million are likely to accrue to the so-called developing countries,–according to current projections.

It is also expected that by the end of the century nearly half the world population will be living in urban areas (defined as places of 20 000 inhabitants or more), and that there will be a need for 5000 new cities of half a million inhabitants each.

Considering the present condition of most of the world's big cities, the symptoms of social breakdown in many of them, the rising crime rates, the failures of so-called "urban renewal", and so forth, the prospect of further rapid growth is a daunting one whether we accept the above projections or not. Much will depend not just on the *degree* but on the *pattern* of urbanization.

IDEAL PATTERN

It is not unduly difficult to imagine an *ideal* pattern of settlement. Every person needs food and other materials,–the products of land; every person also needs what we might call culture,–the products of cities. In fact, every person needs not simply the products of land and of cities but also easy access to both land and cities. It follows that the ideal pattern of settlement would be one which provided all rural areas with easy access to a city. One might say: the ideal pattern is one which equalizes the opportunities of town life and country life to the maximum extent.

The development of the last 150 years or so has not been in this direction. In spite of the great increase in numbers of people, the pattern of settlement has not become one of greater spread or uniformity of density, but the very opposite: extreme congestion on the one hand and vast (relative) emptiness on the other. "About 70 percent of the US population", according to Charles Abrams, "is now concentrated in urban and suburban communities occupying in total only a little more than 1 percent of the nation's land area, and the greatly increased population expected by the year 2000 will still take up only a little more than 2 percent of the land." (1). The situation in most other large countries, particularly large "developing"countries, is similar.

Such figures, it must be admitted, are not conclusive, because they disclose only the degree and not the *pattern* of urbanization: Is it a matter of a large number of relatively small towns or a small number of megalopolitan agglomerations? In the case of the United States we know it is the latter rather than the former; they have coined a special world for it: "Megalopolitanization", and the three main areas affected have their own popular names–"Boswash" for the area extending from Boston to Washington, DC; "Chicpitts" for the area embracing Chicago, Detroit, many other towns, and finally Pittsburgh; and "San-San" for the Western coastal area extending from San Francisco to San Diego.

In these three immense agglomerations there are all the evils of congestion, and outside them there is an emptiness that is both sterile and stultifying.

SOCIAL EVOLUTION?

Professor Kingsley Davis, one of the most renowned students of urbanization, comments: "The large and dense agglomerations comprising the urban population involve a degree of human contact and of social complexity never before known. They exceed in size the communities of any other larger animal; they suggest the behavior of communal insects rather than of mammals." Surprisingly, he also holds

that "urbanized societies, in which a majority of the people live crowded together in towns and cities, represent a new and fundamental step in man's social evolution".

> Between 1850 and 1950 the index (of urbanization, *ie* the proportion of the population living in cities of 100 000 or larger) changed at a much higher rate than from 1800 to 1850, but the rate of change from 1950 to 1960 was twice that of the preceding 50 years! If the pace of increase that obtained between 1950 and 1960 were to remain the same, by 1990 the fraction of the world's people living in cities of 100 000 or larger would be more than half.
>
> Clearly the world as a whole is not fully urbanized, but it soon will be. (2)

For mammals to chose a pattern of living like communal insects may be described as a new and fundamental step in their social evolution, but it is not immediately apparent that it is a step in the right direction.

Urbanization of this kind is a very recent phenomenon. The monstrous growth of Megalopolis drains life not merely out of the rural areas but also out of innumerable small and medium-sized towns. There remains then a nightmarish vision like the one worrying the French planners,–the whole of France becoming "Paris surrounded by a desert". In the United Kingdom there is a seemingly irresistible drain into the South-East, in spite of heroic, or at least incredibly expensive, measures designed to decentralize economic activity into "development areas", which, under one designation or another, cover half the area of the country. Towns which a few centuries ago were world famous and had enough vitality to adorn themselves with some of the finest cathedrals of Europe, seem to be in the grip of ignominious decline, and the rural areas forming the *hinterland* of these towns become more remote from the "real life" of the country than ever before.

CONTINENTAL SCALE

The same tendency is observable on a continental scale. People are moving (and millions more are trying to move) not from overcrowded areas into places with plenty of "Lebensraum", but, on the contrary, from the less to the more overcrowded places; from the periphery into the center: ten to fifteen million foreign workers and their families moving into densely populated Western Europe, to give only one example.

From the rural areas they move into cities; from cities into the megalopolitan area (or areas) of their own country; from there to the city of a country at a higher (so-called) level of development; then on to the megalopolitan area of that country. What is the ultimate destination? Somewhere, there must be a place–or could there be several of them?–a super place, perhaps within one of the super powers–to attract the whole of humanity. Does it really "attract them", or are they being driven there? What are the forces behind this historically unprecedented movement? Does it "represent a new and fundamental step in man's social evolution"? Or is it the effect of causes which can be identified and might be counteracted? Most writers on the subject seem to assume that people leave the rural areas and crowd together in the biggest towns because they like it that way, and, of course, this is likely to be perfectly true with some of them, particularly those who have talents and abilities which urban life can utilize and rural life would waste. But could it be true of the millions of poor people, slum dwellers, the degraded and forgotten masses? Do the migrant workers want to be migrants? Is it their own free choice to leave their native lands, often leaving their families behind, and hawk themselves around as nameless "labor units" in huge foreign cities where (in many cases) hardly anyone can understand their language?

THREE QUESTIONS

Let us then try and find answers to the following three questions:

(a) What has made this movement possible?
(b) What are the principal causes behind it?
(c) How could it be mitigated or avoided?

Although the first cities arose some 5000 or 6000 years ago, the kind of metropolis or megalopolis which we now accept as normal is hardly a hundred years old. If urbanization in the modern sense had been possible before, why did it not happen? If it had been impossible before, what was it that made it possible? Many famous cities grew and grew until they, apparently, could grow no further. What was it that set limits to growth? Normally, the answer is quite simple: they could not be provisioned any more. Towns live on their surroundings, and as they become bigger and bigger they have to be provisioned from ever more extended surroundings, and as distances grow transport can no longer cope. The principal bottleneck was transport and the principal bottleneck of transport was energy. Human and animal power cannot manage long distances, except for imperishable goods of great value per unit of weight; wind and water can give some help, but not enough when it comes to feeding ever burgeoning city populations.

FOSSIL FUEL

During the nineteenth century, Western man broke through this barrier by learning to exploit, on an ever growing scale, nature's storehouse of fossil fuels–first coal, then oil. Coal led to rail transport–because it is rather crude and heavy and therefore best used in locomotives pulling a large number of coaches or trucks; while oil led to motor transport because it is relatively easily refined and then becomes a most versatile fuel, subtle, easily divisible, of high calorific value per unit of volume as well as per unit of weight, and therefore ideally suited for fast, small-scale, decentralized transport from any point to any other point–provided only there is some kind of a road.

The principal answer to the question of "What made the modern city possible?" is therefore: "The largescale exploitation of nature's storehouse of fossil fuels", to which must be added: "at rapidly falling costs." We can say therefore that *the most important material basis of urbanization on the modern pattern has been the availability of cheap and plentiful fossil fuels.*

However, the development of very large cities required the intervention of a further factor. How could people leave the land and crowd together in towns and cities *and still get fed?* A decisive limiting factor on urbanization is the productivity of agriculture–and the meaning of productivity in this

context is *output-per-man* rather than *output-per-acre*. Towns and cities exist on the agricultural surplus of the countryside; pure subsistence farming cannot sustain even the smallest degree of urbanization. If it takes eighty people's work on the land to feed a hundred people, eighty percent of the people must stay on the land and only twenty percent can live and work in towns and cities. How, then, has it been possible to sustain the high degree of urbanization which has characterized the modern world during the last hundred years? I think the answer is plain enough: By an immense improvement of productivity-per-man in modern agriculture. And how has that been achieved? There are many answers, but I think it will be agreed that the most important single factor has been the introduction of new technologies based on large inputs of fossil fuels, mainly oil and natural gas. Modern agricultural technology as practiced in the United States, in Western Europe, in the areas affected by the "green revolution", and in many other parts of the world is essentially oil-based. Its tremendous success in raising productivity-per-man was achieved by the introduction of intensely oil-based technologies; mechanization and–even more importantly–chemicalization. In terms of physics and chemistry, modern man eats a variety of foodstuffs; in terms of economics, he eats oil. (The policy has been "successful" in raising productivity-per-man; the attendant disadvantages in terms of the health of soil, plant, animal, and man are not under consideration in the present context.)

We have now come to the point where we can answer our first question, namely, "What has made this movement of urbanization possible?" The answer can be given in three parts:

- Basically, the exploitation of nature's storehouse of fossil fuels;
- specifically, the development of a highly efficient transport system, initially coal-based but now mainly oil-based;
- and, the development of agricultural technologies which are virtually entirely dependent on oil.

If this answer is correct, it is not reassuring. It suggests that this very recent development, the creation of a new and historically unique pattern of urban settlement, under which a majority of people live crowded together in colossal conurbations, has been made possible by the prodigious use of non-renewable fossil fuels. It is in fact the *result* of a hundred years of cheapness and plenty as regards these fuels. When they are no longer cheap and cease to be plentiful, the pattern may turn out to be inappropriate or even unsustainable. A new pattern will have to be evolved to meet the new situation. Before we can pursue this matter any further, we must now turn our attention to the second question: "What are the principal causes or driving forces behind this movement of modern urbanization?"

CAUSES OF URBANIZATION

To say that people migrate into big cities because they expect to find a better life there than they can find in their place of birth, is to state the obvious: they move because they want to move – but *why* do they want to move? Here is a newspaper report from Latin America:

> Fidel Escalante, 56, did what hundreds of thousands of Latin Americans are doing each year: He packed his few belongings and set out to start life over again in the big city. But his new life is hardly better than his old one: occasionally he gets work as a bricklayer, and his home is a hovel in the "misery belt" of shanty towns that ring (every big city). "I'd like to go back to my village," he says, "but there is no use talking about it. I'd just have to return here. *There is no way out.*". . . More and more people seek to escape the unemployment and near starvation of the countryside . . . They hope for food and jobs. For nearly all, the chances of ever rising out of the slums are slim. The man finds odd jobs; the mother sells pumpkin seeds and peanuts on street corners, while the children hawk papers, lottery tickets, or rummage in garbage cans for scraps.

"I'd like to go back to my village, but . . . There is no way out" this is the truth of the matter. In the rural areas of the developing countries, and of many highly industrialized countries as well, there are not enough jobs to hold the people, and such jobs as there are, almost exclusively agricultural, provide neither excitement nor stimulus; so the people leave, particularly the young and those with courage or talent above the average.

In many years of work in or for developing countries, I have come to the conclusion that the problem of economic misery cannot be solved in the cities; if it can be solved at all then only by the revitalization of life in villages and in small and medium-sized towns. The rural areas cannot hold their people because they are culturally and (in most cases) economically stagnant, retrogressive, decaying. All over the world it can be observed that the range of activities in these areas is diminishing; non-agricultural activities are dying out; what they used to make themselves they now receive in cellophaned packages from the big city; and even agriculture itself tends to become reduced to monoculture.

The forces that move people into the slums of monster cities and conurbations are not found in the attractiveness of the cities but in the decay of life outside them. Unless this process of decay is stopped and reversed a catastrophic deterioration in the condition of mankind cannot be averted.

DECAY OF RURAL LIFE

But what is it that causes the decay of rural life? Why is it that the rural areas lose their non-agricultural activities? Why does agriculture reduce itself to monoculture? Why is it that *even with increases in agricultural productivity and incomes* the rural areas, not only in developing countries but in many highly industrialized countries as well, are being depopulated and devitalized?

The answer, I am sure, can be found in the development of technology during the last hundred years, and particularly since the end of the Second World War.

Although man shapes technology, once he has shaped it technology tends to shape him. It shapes him, his pattern of settlement, his life style, and it also, as it were, determines the "essence" of his political system. That is to say, the "shape" of technology has become the dominant formative agent, and without changing technology nothing important can be changed. The good intentions of town and country planners come to nothing; vast public expenditure comes to nothing, even political revolution changes nothing except the composition of the ruling clique *unless there is also a change in the shape of technology.*

In their *Manifesto of the Communist Party* Marx and Engels argued that "owing to the development of the bourgeoisie, to freedom of commerce, to the world market, to uniformity in the mode of production and in the conditions of life corresponding thereto" national differences and antagonisms between peoples "are vanishing gradually from day to day". They asked:

> Does it require deep intuition to comprehend that man's ideas, views, and conceptions–in one word, man's consciousness–changes with every change in the conditions of his material existence, in his social relations and in his social life? (3)

All the same, neither the "development of the bourgeoisie" nor freedom of trade, nor the world market, have led to or been accompanied by increasing "uniformity in the mode of production and in the conditions of life"; nor have national differences and antagonisms between peoples vanished "gradually from day to day". Taking the world as a whole, the gap between rich and poor has not narrowed but widened and the chances and possibilities of the poor effectively helping themselves have almost disappeared from view. The very fact that it is widely believed that *development depends on aid* indicates a significant decline in the idea of *self-help*. The poor are becoming more dependent on the rich, not less dependent; the developing countries, similarly, are becoming more, and not less, dependent on aid from the industrialized nations. The poor regions *even inside some highly industrialized countries* are remaining poor and offer their inhabitants nothing better than the choice between continuing poverty or migration into some far-away city (which normally means: city-slum). The pattern of settlement is not becoming more even, harmonious, and balanced, but, on the contrary, more uneven, disharmonious, and unbalanced. For rich and poor alike, technological advance and economic growth do not seem to produce an easier, more relaxed and friendly life-style, but, on the contrary, more strain, stress, hustle, worry, and ill-health.

A PROBLEM OF TECHNOLOGY

These unexpected and paradoxical developments are directly due to the route taken by technological development, a route leading almost invariably to

- excessive size
- excessive complexity
- excessive capital-costliness and
- excessive violence.

This development has affected all aspects of human life; it has created unheard-of and ever growing fuel and energy requirements; it has produced severe ecological and environmental disturbance; it has led to widespread and seemingly insoluble problems of social discontent, largely owing to the destruction of work satsifaction in many occupations. We cannot consider all these various consequences here, and shall limit ourselves to a consideration of the effects of the modern technological development on the *pattern* of human settlement.

When technology develops in such a way that large, complex, highly capital-costly production units appear to be the most "economical" (from the point of view of the unit's cost accounting), it is virtually inevitable that industrial development will be confined to major towns and cities. Such units do not fit into rural areas, villages, small or even medium-sized towns. They are most effective inside or on the outskirts of the largest conurbations, where local markets are large enough to absorb most of the output; where recruitment of specialists, professional assistants, skilled and unskilled labor is easiest; and where the required financial facilities can be readily obtained. To place them anywhere else would be "uneconomic" and make them non-competitive. Normally the tangible and intangible advantages of being in or near a big city are so great that even financial inducements offered by government cannot compensate for them. In any other location, such units would be "white elephants", serving only as an awful warning.

In short, it is *technology*, in its modern development, that forces these units into the big town and city regions *where there is already a great density of industry and population:* that is where the new jobs are established and that is where people have to go if they want a job. Meanwhile, the goods produced by these "superior" units can travel far, because, owing to high capitalization, *marginal* costs are much below *average* costs of production, and they can therefore without great difficulty undersell small producers outside the city region. As a result, non-agricultural production in the rural and small-town areas dies away, job opportunities diminish, and people are *forced* to migrate whether they like it or not.

LAW OF DISAPPEARING MIDDLES

Technologies for mass production by highly complex methods at a high level of capital intensity can do nothing to create jobs outside the already existing great concentrations of people and wealth. To promote work in the rural areas, technologies are needed which are suitable for *efficient* small-scale production, without undue complexity, and with modest capital requirements. Unless special, conscious efforts are made to create and develop such technologies, they will not come into existence. On the contrary, owing to what might be called "the Law of the Disappearing Middle", they tend to disappear as soon as the established technological trends have moved the "frontier of technology" beyond them: That which seems "better" is the enemy of the "good" and causes it to disappear, *even if the great majority of people cannot obtain the "better"*. The majority of people are then deprived even of the "good" and are, as it were, thrown back to the lowest level of technology–*ie* primitive, basic tools which hardly deserve the term of technology at all. For example, the processing of most agricultural products can be and, in fact, has traditionally been done by extremely simple methods; gradually, better methods were developed and better equipment was used: a higher technological level was attained–which we may call Stage II,–near enough to Stage I so that most people could keep in step, that is to say, could master the better methods and afford the better equipment. So-called technological progress then continues and Stage III is reached, followed by Stages IV, V . . . *etc.* Now, the point is this: the next higher stage can be attained only by those at the preceding stage; those who had been left behind–for whatever reason–in the earlier phases lack the re-

sources needed for the highest stage. The intermediate stages, however, once they have been superceded, *disappear:* "the better is the enemy of the good." For those who cannot reach the best, there is only the worst.

One of the causes of this baneful phenomenon, which I call The Law of the Disappearing Middle, is the almost automatic tendency of the research and development (R & D) people in industrial establishments not less than in academic or governmental institutions to rush to the "frontiers" of knowledge and achievement and to prove their worth by doing something that "has never been done before". Bigger, faster, more complex, more astonishing –these are taken as marks of progress, never mind if they require ever more specialization, sophistication, capital expenditure, or (in a special sense) violence. As a result, fewer and fewer people can stay in the economic race, and those who cannot go under and return to Square One. The faster the so-called rate of progress, the greater is the number of people who cannot keep pace and drop out; which means that production becomes concentrated in fewer organizations–hence the phantasmic development of the Multinationals,–and increases in productivity become associated, not so much with a broadly based, "democratic" expansion of output and incomes, but with an ever more drastic concentration of production and incomes in the hands of "the survivors".

DISSAPPEARING MIDDLE CLASS

In rich countries these developments can be partly compensated, as far as incomes are concerned, by an enormous and never ending expansion of welfare payments; in poor countries it produces "dual societies"–great masses of destitute people on the one side–many of them without work and living in slums–and a small, rich élite on the other, who often "earn" in an hour more than most of their compatriots earn in a month. A genuine middle class to connect the extremes does not exist; it has disappeared together with the "disappearing middle" of technology.

The loss of social structure is paralleled by the loss of a coherent structure as far as human settlements are concerned: hence the appearance of vast congestion in a few places and a vast (relative) emptiness in all other places.

TECHNOLOGY WITH A HUMAN FACE

This diagnosis, which for reasons of space had to be given in a somewhat schematic and inevitably crude way–there are indeed many exceptions to these rules which might have been noted–leads to an answer to our third question: "How could these tendencies be mitigated or avoided?" The answer is: "Only by the conscious and systematic development of an efficient technology characterized by relative

- Smallness
- Simplicity
- Capital-cheapness and
- Non-violence,

in other words: a technology "with a human face". The developments of the last hundred years, and particularly of the last thirty years, have given us a technology *incapable of meeting essential human needs.* Today, it is no exaggeration to say that it is "child's play" to land a man on the moon, but beyond the wit of modern man to abolish the housing shortage. That which used to be beyond human ingenuity–like moon landings–has become attainable, and that which used to be taken for granted–like adequate food, shelter, clothing, and "culture"–has become *unattainable for the majority of mankind.*

There is no law of nature that has forced technological development into the direction it has taken; social, political, psychological or other forces–which are anything but "laws"–have produced this result. While man has to submit to the Laws of Nature, *he does not have to submit to these man-made forces.* The only question that remains, therefore, is this:

"Is it possible to create a 'technology with a human face'?"

And there is only one reasonable answer to such a question: "Let's go and try. Then we shall see."

A leading American engineer was asked not long ago why he did not develop technologies with the virtues of Smallness, Simplicity, Capital-cheapness, and Non-violence. He replied: "Because no one has ever asked me for anything like that."

WORK IN PROGRESS

Work in this direction was started some ten years ago by a London group of professionals with extensive overseas experience, who call themselves the Intermediate Technology Development Group (4). Although the Group's primary purpose has been to furnish the poor and unemployed in developing countries with the means to work themselves out of poverty, the results of its work are now attracting increasing interest also from the so-called advanced countries. The Group's activities are based on a number of insights which may be summed up as follows:

1. The source and center of world poverty lies primarily in the rural areas of poor countries, which tend to be bypassed by aid and development as currently practiced.
2. The rural areas will continue to be by-passed and unemployment as well as the drift of migration into cities will continue to grow unless efficient small-scale technologies are made available with assistance in their use.
3. The donor countries and agencies do not at present possess the necessary organized knowledge of adapted, appropriate technologies and communications to be able to assist effectively in rural development on the scale required.
4. In all matters of development the crucial problem is that of chosing the right level of technology to fit the given circumstances; in other words, there is a *choice* of technology, and it cannot be assumed that the technology used in the conurbations of the affluent societies is the only possible one, let alone that it is necessarily the best, for poor regions.
5. The technologies most likely to be appropriate for development in conditions of poverty would be in a sense *intermediate* between–to speak symbolically–the hoe and the tractor, or the sickle and the combine harvester (see Figures 1 and 2).

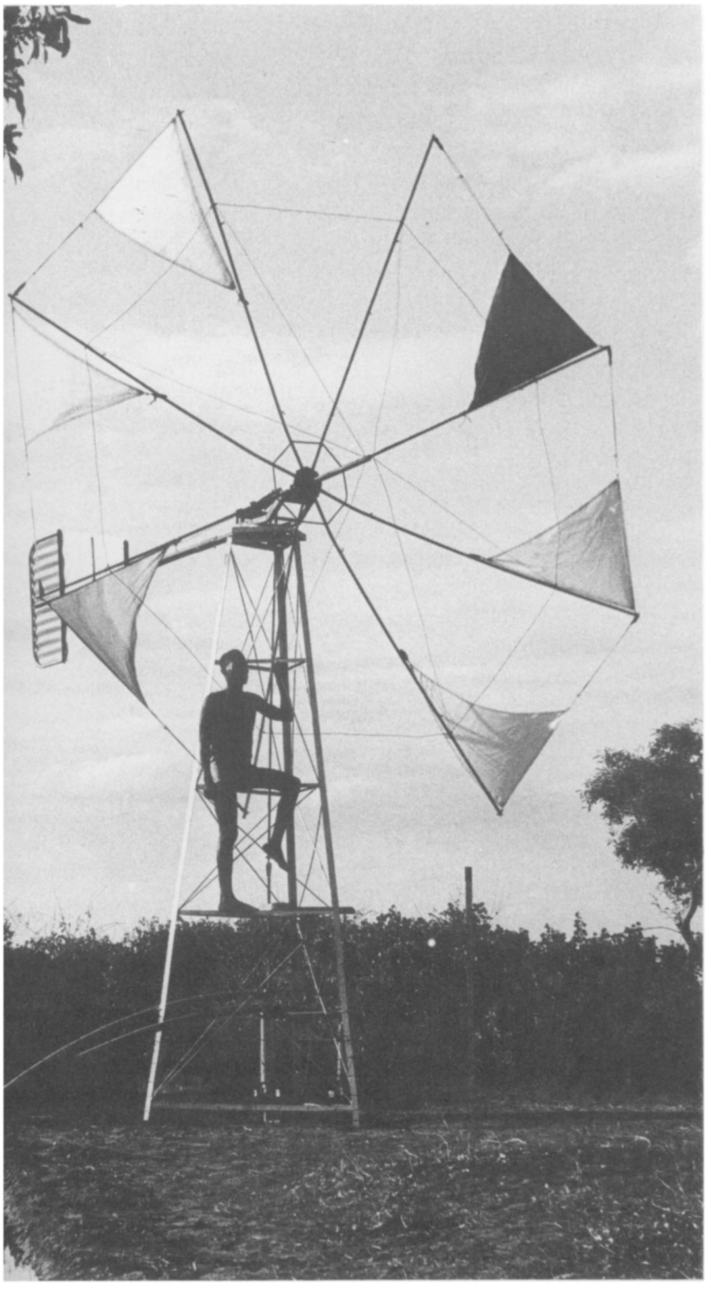


Figure 1. Until the introduction of an improved version of a Cretan-type of sail windmill, farmers in a remote, semi-arid region of Ethiopia could harvest only one crop a year on the damp areas left after the annual flood of the Omo River. For six months of the year, crops cannot be grown without irrigation.

As part of an aid program called "Food From Wind", the Intermediate Technology Group, in an advisory capacity, assisted in improving the windmills, which are now used to pump water from the river.

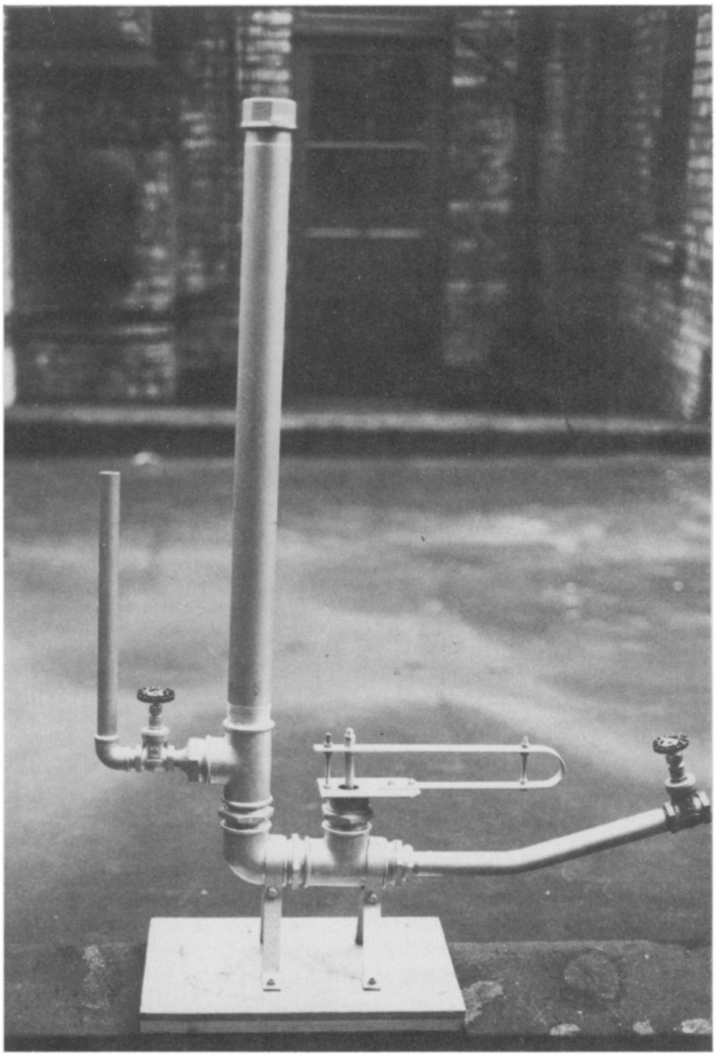
The windwheel is very simple, using the minimum of skills and materials in its construction and operation. The windmill tower is fabricated as a single unit from welded angle iron, and the wheel itself made from steel water pipe, braced with fencing wire. The Terylene sails rigged on the spars are set to provide the maximum turning force on the axle, according to the strength of the wind, and can be reefed by hand if the wind speed increases. Photo: Intermediate Technology Development Group. See also cover.

Know-how at this intermediate level, and the relevant equipment, obviously existed in many places, but no one could say what *gaps* there were, and there was no point anywhere in the world where this know-how could be obtained as and when the people most in need of it required it. Intermediate technology *development* means the work of bringing this kind of knowledge to light, to systematize and, where necessary, complete it, and to organize a world-wide system of "knowledge centers" where it can be readily found.

KNOWLEDGE GAP

Over ten years of work in this field have supplied the Group with plentiful evidence that the knowledge gap which it set out to fill is indeed very wide. The labor-saving, capital-intensive, highly sophisticated technologies, suitable for mass

Figure 2. This example of a hydraulic ram pump is made from ordinary pipe fittings. The hydraulic ram is one of the simplest and cheapest devices for pumping water. It is designed to force running water upwards to a heigh higher than the source. No power is required. Provided there is a supply flow of 5 liters per minute down the drive pipe it will pump 10 percent of the water coming into it up to 10 meters. It has only 2 working parts, and the only maintenance required is to clear away rubbish from the intake filter, and to replace the valve rubbers when they wear. Photo: Intermediate Technology Development Group.



production in rich markets–in other words, the technologies commonly used by the rich countries *in big towns and cities.* are extremely well documented and easily accessible to the rich. By contrast, technologies applicable on a small scale by or in communities with plenty of labor and little capital, lacking technical and organizational sophistication, are on the whole poorly documented, difficult to get hold of, and in many cases even non-existent. There are countless instances where the relevant knowledge *and equipment* used to exist but has virtually disappeared, in accordance with the aforementioned tendency of the "better" to be the enemy of the "good". The world-wide result of these tendencies is the emergence of a *pattern of settlement* which, far from representing "a new and fundamental step in man's social evolution", quite clearly constitutes a deadly disease.

The great task *now* is the speedy creation of new technological possibilities for satisfactory living standards *outside* the great conurbations.

Space does not allow me to go into the details of this work. However, two general lines of design and development work can be specified:

First, in virtually every field of production it is necessary to design efficient (what I call) "mini-plants", *ie* productive equipment that can operate competitively on the smallest possible scale–the smaller the better. Take paper recycling as an example. It is easy to lay hands on a paper recycling plant with a capacity of 100 tonnes a day. Such a plant, however, fits only into the largest conurbations. Where can I get the paper recycling plant with a capacity of (say) 5 tonnes a day, which would fit into any of the hundreds of thousands of small municipalities around the world?

Second, in virtually every field of production it is necessary to bring back into existence the technological "middle" which, in accordance with the Law of the Disappearing Middle has dropped out, leaving a vacuum and making it impossible for the little people of this world to lead a self-reliant, independent, self-respecting existence. In every field, therefore, we require what we call "industrial profiles", showing in precise technical detail what can be done 1) when you have practically no capital; 2) a modest amount of capital; 3) a fair, yet still modest, amount. These three levels, suitable for "cottage", "village", and "small town", are at present lacking. They have to be restored. Above these levels, no help is needed: the trends of the last hundred years are still looking after that.

It will then be possible to accomodate greatly increased populations. Small towns will develop into flourishing cities of modest size. There will be enough towns with an intensely interesting variety of productive activities to give to all rural areas *easy access to culture.*

GEOGRAPHICAL STRUCTURE

To put the matter in another way: Everything needs a certain "structure". Culture needs a consciously evolved structure, and the same goes for industry. In both cases, the structure must be qualitative *and at the same time geographical* if it is to be a healthy one. The ideal cultural structure would look like this: A number of cultural "units" make up the country, each of these "units" containing at least one million and at the most three to five million inhabitants. Each cultural "unit" is a pyramid: primary schools at village level; a number of villages headed up by a market town with a secondary school; a number of market towns headed up by a regional center with an institution of higher learning.

An ideal industrial structure would be essentially similar: small-scale industries in the villages; medium-scale industries in the market towns, large-scale industries (where large-scale is unavoidable) in the regional centers, and only exceptional and unique activities–such as central government–in the capital city.

I am not suggesting that ideal structures are ever attainable in the real world; but they do provide guidelines for conscious policy. A country with a healthy pattern of settlement is like a pyramid resting securely on its base; a country with an unhealthy pattern of settlement–vast congestion in some places and vast emptiness elsewhere–is vulnerable like a pyramid balancing on its apex: it can at any moment fall into total disorder.

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3. K Marx, F Engels, *The Manifesto of the Communists* (International Publishing Company, London, 1886).
4. Intermediate Technology Development Group Limited, a registered charity at Parnell House, 25 Wilton Road, London SW1V 1JS. Booklist obtainable from Intermediate Technology Publications Ltd at 9 King Street, London WC2E 8HN.

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