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E. F. Schumacher and Intermediate Technology

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Technology**

Robert Leonard

Avril 2018

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E. F. Schumacher and Intermediate Technology*

Introduction

It would take considerably more space than is available here to do historical justice to E. F. Schumacher's introduction of the idea of intermediate technology. Although he first made the suggestion in the early 1960's, his ideas on technology, and its place in economic development and culture, had been evolving since at least his formative intellectual crisis of a decade previously.

Up to 1950, when he became an employee at the National Coal Board, Schumacher (1911-1977) was, in many respects, a conventional economist: broadly socialist in outlook, he was confident in Western progress, having a deep knowledge of international monetary affairs and a particular interest in postwar planning.¹ The son of German economics mandarin, Hermann Schumacher, he had left his country in 1930 on a Rhodes Scholarship to Oxford, to study economics and politics. Extending the duration of his scholarship, Schumacher spent a year in New York, studying monetary economics under Columbia University's Parker Willis and then lecturing at that university. Returning to Germany in 1934, he refused to ingratiate himself with the regime, and in 1936, newly married to Anna Maria Petersen from Hamburg, he left for London to work with Unilever. When the war broke out, he was detained briefly, along with other aliens, in Prees Heath internment camp, before being confined to a cottage on Eydon, the Northamptonshire estate owned by senior Treasury figure, Robert Brand. There, Schumacher worked as a farm labourer, yet persisted in writing on economic affairs, particularly on prospective postwar monetary arrangements. It was this that brought him in contact with Keynes and saw him appointed to Oxford's wartime Institute of Statistics, alongside M. Kalecki, T. Balogh and F. Burckhardt, where he spent most of the war.

A committed Fabian, he was a co-author of the Beveridge Report with Nicholas Kaldor and Joan Robinson, and he also participated in Rosenstein-Rodan's wartime seminar in development economics at the Royal Institute of International Affairs at Chatham House. Schumacher's main concern at this time was to provide critical discussion of both the American (White) and British (Keynes) institutional plans for the restoration of postwar trade and payments. To the extent that he was concerned with underdeveloped countries, it was by and large as an incidental corollary to his analysis of the already developed world. Thus, for example, Kalecki and Schumacher's 1943 paper on "International Clearing and Long-Term Lending" argues against the excessive restriction of postwar trade surpluses on the grounds that such accumulated funds could be fruitfully used to provide loans to

* Robert Leonard, UQAM (leonard.robert@uqam.ca). For generously providing access to her family papers and discussing her father's work, I am grateful to Barbara Wood, daughter and biographer of E. F. Schumacher. For their generous help with the archives at the Schumacher Center for a New Economics, Gt. Barrington, Massachusetts, I thank Susan Witt and Amelia Holmes. For conversations about the man, I am grateful to Barbara Wood, again, and to Vreni Schumacher, his widow.

¹ Schumacher has received relatively little scholarly attention. For example, see Wood (1984), an early biography, written by his eldest daughter, and Toye (2011), an assessment of the relevance to Schumacher's impact of various factors including his education, background, personality and moral vision..

underdeveloped regions.² A 1945 paper by Schumacher on “Anglo-Egyptian Currency Relations” argued that the elimination of Egypt’s substantial Sterling balance, accumulated during wartime, would require a policy of the most “rapid industrialization” of which the Egyptians were capable. These remarks on the developing world, however, were essentially made in passing, and were far from being at the centre of his concerns. Having spent 1945 in Germany with the Strategic Bombing Survey, he returned there the following year to work on postwar reconstruction with the Allied Control Commission. There, working alongside fellow socialists such as Walter Fliess, he pressed, ultimately without success, for the nationalization of German heavy industry. He remained in Germany until 1949, at which point he was happy to return to the U.K., to a post at the National Coal Board.

In the early 1950’s, however, notwithstanding his professional responsibilities at the N.C.B., Schumacher underwent a protracted intellectual and spiritual crisis, which led him to challenge, and abandon, many of his early, conventional beliefs about science, religion and human progress. This crisis, which appears to have been triggered by his shock at the modern German catastrophe, marked the beginning of the demise of the conventional economist in him and the subsequent emergence of “Schumacher”, the sage and prophetic figure eventually read by millions, especially after the publication of his 1973 book, *Small is Beautiful*.

In what follows, we first consider briefly the critical years from 1950 till 1955, the period of spiritual quest that ultimately led him to Burma, where he wrote the first version of his famous essay, “Buddhist Economics”, an essay that marked him as one of the first Western economists to become disillusioned with conventional economic development. We then consider the ensuing decade, during which he became increasingly “anti-modern”, visited India and began to give explicit consideration to levels of technology. Out of this emerged the intermediate technology idea and the formation of the Intermediate Technology Development Group. We close with some concluding reflections.

The making of “Schumacher”, 1950 - 1955

If there were already signs of disenchantment with the modern world in the mid-1940’s, particularly when Schumacher confronted the ruins of German civilization, his criticism widened and deepened in the early 1950’s, when he and his young family settled down in Surrey. The change of perspective was catalysed by readings and new experiences in various fields.

Firstly, not only did he cultivate his own garden, but he became very interested in debates surrounding the modern transformation of agriculture through the use of chemicals and mechanisation, with attendant effects on both food quality and the rural environment. He read, amongst other things, Eve Balfour’s (1943) *The Living Soil*, her rousing manifesto for

² See Kalecki and Schumacher (1943), p. 31. See also Schumacher (1943a) and (1943b). On Schumacher’s contribution to the Bretton Woods debates, see Helleiner (2014), p. 242.

what would later be known as the organic movement.³ He also joined the Soil Association, created by Balfour, and even invited them to give a talk and present a film at his Coal Board offices. Like Balfour and several others he read, Schumacher was affected by Alexis Carrel's (1935) *Man the Unknown*, which saw modern scientific and industrial progress as leading to excessive comfort and weakness in contemporary humanity.⁴

Secondly, having previously shown a disinterest in religious or spiritual matters, he became involved in the movement surrounding the cult figure and mystic, G. I. Gurdjieff and his follower, Pyotr Ouspensky. Schumacher was particularly influenced by the writings and teachings of Gurdjieff's London followers, Maurice Nicoll and John G. Bennett. All of this not only opened him up to the spiritual realm but cultivated in him an interest in the "East", as a source of traditional wisdom, alternative to the materialistic West. Joining the Buddhist Society in London, Schumacher began to read widely on the subject, eventually accumulating an extensive library, and he took up the practice of yoga, under the influence of teacher, Selvarajan Yesudian. So significant was the effect of all these readings and activities that, by 1953, Schumacher could report to his wife that he was undergoing a reorientation in his "entire attitude to life".⁵

The third, and arguably most deep and long-lasting, influence upon Schumacher was his discovery of the Traditionalist writings of René Guénon, Ananda Coomaraswamy and Frithjof Schuon. In their work, beginning most forcefully with Guénon's (1942) *The Crisis of the Modern World*, the Traditionalists portrayed the entire period of Western modernity since the 17th century as a deviation from humanity's true purpose on earth. At the centre of the Traditionalist vision lay the *Sophia Perennis*, or Perennial Wisdom, which posited the ultimate dependence of all manifestation (i.e., the existing natural and human world) upon a supreme or divine power, with the world's great religions being various expressions of this timeless metaphysical truth. Although he appears to have had but an introduction to Traditionalism before heading for Burma in 1955, Schumacher would soon find therein a deep and all-encompassing perspective on the human condition and a consoling vision of potential cosmic order. In time, it would affect his views on everything from the abuse of quantification and statistics through the appropriate use of technology to his attitude to material poverty and wealth.

Stimulated by these new readings, on the natural order, on modern industrial society and on Eastern wisdom, Schumacher took off for Burma, where he spent three months as a U.N. economist, evaluating the country's plans for economic and social development. Here, faced with American-inspired, materialistic plans that threatened to disturb a traditional

³ See also Lymington (1938), Massingham (1945) and Northbourne (1940).

⁴ Not unlike several of the authors in the rural revival movement, Carrel's political views were sympathetic to fascism. Indeed, had he not died in 1944, he might well have been pursued in postwar France for his closeness to the forces of occupation: he was a central figure in the *Fondation française pour l'Etude des Problèmes humains*, created by the Vichy regime in 1941. (See Reggiani 2007). It is a measure of the intellectual effervescence of the 1930's that Carrel was read with serious interest by a heterogeneous readership, many of whom hardly shared his political views. These included not only Eve Balfour herself but even Schumacher's yoga guide, Selvarajan Yesudian.

⁵ EFS to Anna Maria Schumacher, March 3, 1954, Schumacher Family Papers London, hereafter SFPL.

and, in Schumacher's eyes, satisfactory social order, he wrote the first version of what was to become his most famous essay, "Buddhist Economics". If Burma were to develop in a manner that preserved its spiritual ethos, it could only be by resisting the pressures of the West, looking to Gandhian simplicity and localism as a source of inspiration, and finding its own "Middle Way". Part of this involved resisting the temptations of mechanized factory production in favour of manual craft and workmanship. It also required recognizing that the use of non-renewable resources, such as oil and coal, could not be sustained permanently.⁶ After Burma, Schumacher became familiar with the work of Gandhian economist, Joseph Kumarappa, who, for at least a decade, had been arguing the need for a "permanent", or sustainable, economy – one which, by definition, could not be based upon the depletion of non-renewable resources.⁷ With such ideas on economic development in turn affecting Schumacher's perception of the developed West, he became an early conduit for the passage of influence, not from the North to the South, as was overwhelmingly the case, but in the opposite direction.⁸

Following his return from Burma, Schumacher not only deepened his engagement with the Traditionalists and also read the ideas on technology of his famous brother-in-law, Werner Heisenberg.⁹ Not only was the German nuclear physicist part of the family, he was representative of the modern scientific and industrial society, the desirability of which Schumacher was beginning to call into question. While Heisenberg showed himself to be quite accepting of the inevitability of both technological change and its disruptive cultural impact, Schumacher disagreed, believing that a society prepared to tolerate nuclear waste and content to rely on non-renewable resources was, of necessity, a society destined to fail. These and other readings all served to harden Schumacher in what might be called his "anti-modernism".

Intermediate Technology

Schumacher's unpublished "Buddhist Economics" essay was noticed by J. P. Narayan, the Indian socialist-turned-Gandhian, whom Schumacher met in London in 1958.¹⁰ As a result, Schumacher was invited to a conference in India, in Poona, in early 1961, with his talks being published the following year as a pamphlet, "The Roots of Economic Growth".¹¹

⁶ It is clear that by the time he visited Burma Schumacher was familiar with Gandhi's writings and was also reading Coomaraswamy's (1912) *Art and Swadeshi*, which lamented the loss of traditional craft in India, even when, under Gandhi's *Swadeshi* initiative, imports were replaced by local production. It was through his engagement with Indian art and politics that Coomaraswamy, a geologist-turned-art historian, in time became a key figure the Traditionalist canon.

⁷ See Kumarappa, J.C. (1958, orig. 1946), *Economy of Permanence*, 4th ed., Rajghat, Kashi: Sarva-Seva-Sangh-Publication. On other Indian contributions to development thinking, see the Dutt essay in this volume.

⁸ I thank a referee for pointing out this simple truth.

⁹ The books read by Schumacher included Heisenberg (1958a) and (1958b).

¹⁰ Narayan included it, under its then-title "Economics in a Buddhist Country", as an appendix in his 1959 book, *A Plea for Reconstruction of Indian Polity*.

¹¹ See Schumacher (1962). This collection also included "Economics in a Buddhist Country" from 1955; "Non-violent Economics", his *Observer* article of August 1960; as well as two articles he wrote subsequent to his visit, "Notes on Indian Development Problems" (April 1961) and "Levels of Technology" (July 1961).

In his main talk, “Help to Those Who Need it Most: Some Problems of Economic Development”, Schumacher criticized World Bank President, Eugene Black, who, in a recent article, had emphasized the need for material economic development, and presented any social, psychological, moral or political changes as merely means to that end.¹² Schumacher agreed with the need to alleviate human misery, but disagreed that men ought to be *driven* in order to develop a Western work ethic, or that the practices of advanced countries were worthy of imitation. Black’s attitude, he said, revealed “not only an astounding lack of imagination but also a truly ominous lack of awareness of the dehumanising deformities of the modern West” (p. 32). The problem with development programmes as they had been applied thus far was that they were bringing sophisticated production techniques and materially high living-standards to a small minority of the population, but generating apathy and paralysis in the remaining 80%. Some way had to be found of encouraging the “spontaneous mobilization of this labour power” (p. 34).

In both “Paths to Economic Growth” and his main address, Schumacher addressed Walt Rostow’s “beautiful theory . . . derived from aeronautics” (p. 15), with its suggestion that a “take-off” would occur when the right conditions were met.¹³ The conditions were to ensure productive investment of over 10% of national income; the development of one or more substantial manufacturing sectors; and the emergence of a political, social and institutional framework that exploited the modern sectors’s impulse to expansion. Such sentences, said Schumacher, while they might be accurate descriptions of past events, should not be adopted as prescriptive “conditions” for development. “Being abstractions, they cannot be ‘done’ (except possibly by totalitarian methods); they do not touch the people’s heart; they induce the imagination to turn to the actual – that which exists already, and exists most conspicuously in the rich countries – whereas it should be turned to the potential, namely, the unused labour power and creativeness of the indigenous population” (p. 35).

And yet something had to be done, he said. The grinding poverty, apathy and despair of millions of Indians was not a normal historical development, for people had always found a way to provide for their needs. What was new was the misery that was affecting hundreds of thousands, even in peacetime: “-- a monstrous and scandalous thing which is altogether abnormal in the history of mankind” (p. 37).

The underlying reason, said Schumacher, was the *paralyzing* effect of the modern West, like the effect of Cortes on the Aztecs. It was the suddenness and size of the change that was deleterious. The implantation of a modern transport system had the effect of opening up the regional towns and villages to competition from cheaper goods produced in advanced factories in the metropolitan centres. Denied their own livelihoods, the rural people weren’t even able to buy such goods. One could not ignore the effect of aid schemes on the

¹² See Black (1960).

¹³ He refers throughout to Rostow (1956), not to Rostow’s 1960 book-length treatment, The Stages of Economic Growth: A Non-Communist Manifesto. For more on Rostow, see the paper by Gilman in this volume.

population. What was required was to “Find out what the people are trying to do and help them to do it better” (p. 42).¹⁴

In “Notes on Indian Development Problems”, written in April after coming back from India, he wrote that the metropolitan areas, with 15% of the population, and the rural- or rump economy, with the rest, were poisoning each other. The advanced industries in the former were killing off production of wage-goods in the rural areas, causing despondency and migration to the city. The decline of the rural economies caused cultural starvation which further damaged agriculture, for the latter needed the stimulus of industrial crafts and cultural influences in order to thrive. In order to ensure uniform local development, there was a need for planning on a district-, not a national, basis.

In “Levels of Technology: A key problem for underdeveloped countries”, written in July, Schumacher honed in on the technology question. The problem was the co-existence in developing countries of the jet engine and the bullock cart, with the false hope that a country could jump from one to the other without going through the intermediate stages, a process that, for the now-developed countries, had taken centuries. The isolated islands of technology that had been implanted were damaging the rest of the economy by, firstly, destroying regional production and, secondly, dividing the society into rich and poor.

Because the opportunity cost of labour was so low, it would be better to focus on labour-intensive production, and encourage the creation of workplaces the cost of which bore some reasonable relation to Indian wages. Otherwise, such investment would be forever out of reach of local entrepreneurs.

“The rich countries did not become rich by suddenly employing advanced technology. They increased the capital embodied in each workplace gradually over time. The developing countries must advance one step at a time. This is impossible to specify quantitatively and precisely, but it means that the technology introduced must remain within the reach of the people” (p. 56).

In November 1962, he returned to India for a six-week stay as advisor to the Indian Planning Commission. He was shown around, visiting workshops and factories and speaking to people. He spent time with Gandhi’s disciple, Vinoba Bhave, the leader of the Gramdan, or land-transfer, movement.¹⁵ His report to the Planning Commission in New Delhi, which reiterated the need to choose cheaper technology and develop organically, was published in *India at Midpassage*, the 1964 assessment by London’s Overseas Development Institute.

¹⁴ As indicated in Coomaraswamy’s (1912) *Art and Swadeshi*, which Schumacher read, this phrase comes from Ruskin: “If you find yourself set in a position of authority and are entrusted to determine modes of education, ascertain first what the people you would teach have been in the habit of doing, and encourage them to do that better” (p. 141).

¹⁵ On Bhave, see Linton (1972).

In the same year, Schumacher presented his ideas to the Cambridge Conference on Development.¹⁶ Create workplaces where they are needed, he said; do so cheaply; use simple methods; and produce for local use using local materials. Western capital-intensive technology, which was intended to substitute for scarce labour, was inappropriate in countries where labour was abundant. He criticized the “development ‘experts’”, who were unable to conceive of production unless all the paraphernalia of the Western way of life was already installed: “electricity, steel, cement, near-perfect organisation, sophisticated accountancy (preferably with computers), not to mention a most elaborate ‘infrastructure’ of transport and other public services” (p. 136). Preliminary design studies in India, he claimed, were already showing that items produced with intermediate technology were fully competitive with Western ones.

He closed almost poetically, with allusions, for the alert listener, to Balfour on the soil, Coomaraswamy on craft, the Bodhi tree, and pagodas and cathedrals built by hand with lime mortar:

“[Development] will have to rely mainly on local materials, and these will be just the same as those on which all pre-industrial generations have had to rely. It is a remarkable fact how much of the traditional knowledge of local materials has been lost during the last two or three generations. People will have to learn again that it is possible to have a highly productive agriculture by means of ‘green manure’ and other organic methods, and that chemical fertilisers may not be the real answer at all. They will have to remember that their forefathers built without modern cement and yet extremely durably; how much they relied on trees, not merely for the supply of food and materials but also for the improvement of soil and climate. With the help of modern knowledge they should now be able to do even better in these respects than their forefathers did. Tree planting, indeed, deserves to be singled out for special emphasis in this context, because the world is full of cases where the neglect of trees is one of the chief causes of misery and helplessness, while the recovery of a realistic sense of man’s dependence on trees would be a most fruitful move in the right direction. No high technology or foreign aid is needed for planting and looking after trees; every able-bodied person can make his contribution and benefit from it; a wide range of useful materials can be obtained from trees – some species being very fast growers in tropical and even semi-tropical climates – and these materials lend themselves exceptionally well for utilisation by ‘intermediate technology’. Yet there are few ‘developing’ countries where trees do not suffer from heedless neglect. . . In most places there is no excuse for any alleged shortages of building materials. The planning experts should study how much has been built without modern cement throughout the ages” (pp. 140-141).

Not surprisingly perhaps, the assembled economists criticized him, saying that he was promoting the waste of capital resources and the production of non-competitive goods. The ensuing debate was, by all accounts, lively, with the economists sticking to their benign view of development through advanced industrialization. Intermediate technology, they

¹⁶ See Schumacher (1964b).

argued, simply could not fuel the economic growth needed to absorb the surplus population in agriculture. Schumacher was accused of being a romantic conservative, an Anglo-Saxon prone to idealizing peasant life. Undaunted, he stuck to his view that the expanding metropolis and declining rural sector were poisoning one another.¹⁷ He followed up with “How to Help Them Help Themselves”, an Observer article in August of the same year, replying to the economists and further pressing the idea.¹⁸

Earlier, in May, following discussions between Schumacher, George McRobie and Julia Porter, a group of about twenty had come together, on a purely voluntary basis, in order to do something to promote these ideas in developing countries. The result was the formation of the Intermediate Technology Development Group, its first capital injection being the fee from Schumacher’s Observer article.¹⁹

Tools for Progress.

The ITDG’s first catalogue, Tools for Progress, appeared in 1967.²⁰ An introductory article by Schumacher, which had earlier appeared in The Times, described the central problem: how to provide support to the great rural populations of Southeast Asia, Africa and Latin America, if the problems of hunger, mass unemployment and uncontrolled urbanisation were to be mitigated. “To raise the level of agriculture, the whole level of peasant life has to be raised, and this means the development of an agro-industrial structure in the rural areas, so that each community can offer a large variety of occupations for its members” (p. 7). For every tool, machine and other item of equipment illustrated, the catalogue provided an illustrated description and the name of the British company from whom it could be ordered. The products were grouped under Agriculture, Building, Education, Fishing, Forestry & Woodworking, Handicrafts & Small-scale Manufacture, Handling, Measurement, Metal Working & Machine Maintenance, Power, Transport & Roadmaking and Water Supply.

¹⁷ See McRobie (1981), pp. 23 – 24; also Robinson (1971), p. 8 and, especially, pp. 94 – 106, which summarizes the Cambridge conference debate surrounding Schumacher’s presentation.

¹⁸ See Schumacher (1965b). Only design studies and empirical investigation, he said, could tell which kind of technology produced the most favourable capital-output ratio and whether or not the goods produced were competitive. There were no laws of nature or man to prove in the abstract that the most advanced technology was the most economic. *Op cit.*, pp. 25 – 30.

¹⁹ Julia Porter (1926 - 1992), who was then managing the Africa Development Trust, would become a key organiser and fundraiser for the ITDG. See Obituary, The Guardian, Aug. 30, 1992. McRobie (1925 - 2016) would be even more important, becoming Schumacher’s “Man Friday” and a central figure in the Intermediate Technology movement. Following a degree in economics at the LSE, McRobie worked at the independent think-tank, Political and Economic Planning, before moving to the Coal Board where he came to know Schumacher. In the early Sixties, he spent time in India working on a Ford Foundation project, before returning to London where he joined the ITDG. McRobie’s wife, Sybil, was an editor, first at the Royal Institute of International Affairs and then at Political and Economic Planning. See Obituary, The Guardian, July 10, 2007. For more on McRobie’s involvement in the ITDG, see McRobie (1981).

²⁰ Intermediate Technology Development Group (1967), Tools for Progress: Guide to Equipment and Materials for Small-scale Development, London: ITDG. It was the result of a year’s research, financed by the Scott Bader Commonwealth, War on Want, the William Johnston Yapp Charitable Trust and Oxfam, which involved surveying companies to determine which of their products were suitable for sale to developing communities.

Many of the tools advertised were used by hand or drawn by an animal. For example, in addition to the usual garden equipment, the hand-operated tools included mills, rice hullers and maize shellers. The Norfolk metal-bender allowed a man to bend pipe and other kinds of metal, while the hand-powered Mat-Making Loom produced mats of various kinds. The animal-drawn farm equipment included ploughs, harrows, hoes and multi-use tool bars. Other tools, such as a machine for shelling ground-nuts, could be powered either by hand or by motor. Several small tractors were featured, as was a range of small pumps, for irrigation and drainage.

One might have expected the catalogue to be “pure”, in reflection of Schumacher’s concern with modern agriculture and his membership of the Soil Association, but it was far from it. The brochure reflected the advice of various groups of “experts”, required funding through advertising and, above all perhaps, had to pragmatically cater to the perceived needs of its target readers. Thus, in addition to the requisite manual- and powered sprayers, it offered fertilizers from Imperial Chemical Industries along with chemical crop-sprayers and greenhouse smoke-bombs containing Lindane, Dieldrin or DDT.²¹ It even featured a full-page advertisement by Shell Chemicals for their insecticides, fungicides and herbicides. Yet, for all its pragmatic concessions to modern technology, the catalogue was traditional in thrust. As Schumacher had repeatedly stated, its aim was to keep people on the land and in the villages, to do something for the majority who had failed to benefit from, or had been actively harmed by, the “Westernisation” of a minority.

The catalogue was also successful, leading to significant demand for information from various countries. In response, beginning in 1968, the ITDG began to form its own support network of voluntary panels of experts, first in building, then water supply, and, shortly afterwards, agriculture, health and cooperatives. By the end of the 1970’s, its network comprised some 300 professionals, and it had fifteen technical staff, seven of whom were in Africa running projects. By the 1980’s, the work of the ITDG extended to many areas, including building (e.g., the use of traditional lime-pozzolana mortars), water (e.g. rainwater collection tanks), farming (e.g., instruction in the manufacture of small tools), transport (e.g., developing an efficient rickshaw, the Oxtrike), energy (e.g., windmills for low-lift irrigation), health (e.g., promoting the employment of auxiliaries in village healthcare) and women (e.g. labour-saving milling- and weeding machines; water purification).²²

Closing Remarks

²¹ For example, as is well known, DDT would later be shown to be responsible for the mass destruction of the Peregrine Falcon in North America and Western Europe, with the consumption of DDT-laden prey causing weakening of the raptor’s eggshells.

²² McRobie (1981) provides an account of the work of the ITDG in its first fifteen years. In light of the sprayers and pesticides included in *Tools for Progress*, it is worth noting that, by 1981, McRobie was criticizing the fact that “the smallholder in developing countries . . . is being persuaded to adopt the chemical farming practices of the West. The intensive use of herbicides, pesticides and inorganic fertilizers is an advanced – possibly terminal – form of violence, the equivalent in agriculture of the use of nuclear power in industry” (p. 49).

In 1973, after considerable difficulty in finding a publisher, Schumacher released a collection of his essays, Small is Beautiful: A Study of Economics as if People Mattered. These were organised in sections covering the Modern World; Resources: the Third World, and Organisation and Ownership. The book makes it clear that, just as much as for “developing” countries, the technology question was a matter for the developed West, where Schumacher emphasized the violence of modern industrial, scientific culture. With the rapid development in the volume of economic production and the scientific development of new pollutants, he said, the terms “pollution, environment and ecology” had suddenly gained prominence. The tolerance margins which “benign nature” had always provided were now being challenged. The development of nuclear power, with its intractable waste disposal problem, was an environmental threat of the greatest magnitude. Not only was the external environment being eroded by technological development, so too was “the very substance of industrial man” in the form of “crime, drug addiction, vandalism, mental breakdown, rebellion” (pp. 16 – 17). Too little attention had been paid to preserving the quality of working life and too much to accelerating industrial development. The West, he wrote bluntly, having ignored all limitations, was on a collision course towards destruction. The book’s essays explored essentially these themes, from various perspectives, invariably resolving in a *moral* appeal by Schumacher for restraint and improved behaviour. It made for powerful reading and turned Schumacher, almost overnight, into a leading figure in the counterculture of the 1970’s, with tours of American university campuses and even a summons to Jimmy Carter’s White House. Happy that his ideas were finally receiving attention, Schumacher responded avidly to the public demand for talks and appearances and may well have exhausted himself in the process, dying of a heart attack on a Swiss train in 1977, at the age of 66.

After Schumacher’s death, the Appropriate Technology movement took a life of its own, with the I.T.D.G. at its centre. In the “Third World”, Appropriate Technology organizations were set up in countries such as India, Pakistan, Sri Lanka, Zambia, Kenya, Malawi and Tanzania. Although international organizations were slow to endorse the movement, with the exception of the International Labor Office, after the oil crisis of 1973, there was a change of opinion.²³ Following the success of various I.T.D.G. projects in Nigeria and Zambia, the British Ministry of Overseas Development began to provide more substantial support. Western countries such as France, Germany, the Scandinavian states and The Netherlands began to give special emphasis to intermediate technology in their aid programmes. By 1985, Frances Stewart could write that that the movement had “gained a vast number of adherents, including some governments . . . and a good deal of the aid ‘establishment’ in advanced countries” (in Carr (ed.) (1985), p. xiii). Yet, there were also obstacles to its adoption. In some cases, the appropriate technology simply did not *exist*. In others, even though a simpler technology might exist, either it failed on grounds of *efficiency* or the expressed preference for advanced products meant that it could not be chosen. In yet other instances, the *choice* of technology was subject to distorting influences, including credit allocation, aggressive promotion by high-tech producers, and the influence of corrupt élite minorities with a taste for advanced products. There was also need for

²³ See McRobie (1981), *passim*.

greater attention to the promotion of existing appropriate technologies and to the “endogenisation” of such work, rather than letting it remain the responsibility of outsiders.

Within the developed countries themselves, as part of the “counterculture” of the 1970’s, there emerged various appropriate-technology initiatives, many of them in the domains of agriculture and energy, where reliance on petrochemicals was great. In Britain, the promotion of “biological husbandry” was conducted by groups such as the Soil Association, the Organic Farmers and Growers Co-operative and the Henry Doubleday Research Association.²⁴ In the U.S., inspired by the writings of Rachel Carson, Wendell Berry and Hazel Henderson, and the back-to-the-land movement led by Helen and Scott Nearing, an entire *Schumacherian* generation turned to alternatives. For example, the New Alchemy Institute on Cape Cod, Massachusetts, conducted research on aquaculture, organic agriculture, solar energy, windmills and bio-shelters. In Canada, the Institute for Man and Resources in Prince Edward Island engaged in appropriate-technology research in the hope of countering the island’s trajectory from an abundance of small, mixed family-farms to a homogeneous, large-scale, chemical-laden monoculture based on the potato.

Beginning with the ITDG’s own quarterly journal, *Appropriate Technology*, the field also gave rise to a substantial literature, both practical and theoretical. For example, Stewart (1977) pursues the theoretical debate on technology choice, providing a critique of neoclassical analysis. Marilyn Carr’s *AT Reader* (1985) features extracts from the work of Jacques Ellul, Rachel Carson and Ivan Illich, amongst others, showing how Schumacher’s ideas had found a place within the counter-culture of the Seventies. And yet, for all that, Schumacher was largely ignored by the mainstream academic community of development economists. In fact, as one referee for this essay pointed out, he is curiously absent even in contributions where one would most expect to find him, such as *Encountering Development*, Arturo Escobar’s 1995 critique of the field. His legacy is however evident in the work of several critical, non-mainstream figures, including not only the early AT affiliates themselves, but later figures such as Paul Elkins and Manfred Max-Neef.²⁵

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With hindsight, one can identify several dimensions to Schumacher’s originality as a economic thinker. Not only was he one of the first Western critics of postwar development, but he was also one of the few to assimilate influences from the “South” and carry them “North”, going against the dominant current. Influenced by his experience in Burma and India, in his mature work he advocated Gandhian “simplicity” and “non-violence”, and Kumarappan “permanence”, or sustainability, as necessary elements in the future development of both the “underdeveloped” countries and the West. Traditionalism, one of the most significant metaphysical influence on him from the 1950’s onwards, was

²⁴ Long a member of the Soil Association, Schumacher was its President from 1970 until 1977. See Gill (2010) and Conford (2011).

²⁵ See, for example, Max-Neef (1992), Max-Neef et al (1991) and Elkins and Max-Neef (1992) as well as Elkins (1992). For critical perspectives, see Rybczynski (1980) and Willoughby (1990).

elaborated by three writers, Gu  non, Schuon and Coomaraswamy, who were steeped in Eastern spiritual traditions. And yet, Schumacher's apparent openness to non-Western ideas should not lead one to simplistic conclusions about the direction of causality. For example, before going to Burma, where he expressed his opposition to development plans that would encourage the exodus from the rural villages to the urban centres, he had already absorbed the ideas of British writers of the interwar rural revival movement, including Massingham, Wrench, Northbourne and Balfour, all of whom were concerned with the transformation of the English countryside. His perspective on Burma was thus shaped by his view of England. His "intermediate technology" idea, too, with its prescription of a middle path between the return to craft and the embrace of advanced technology, although highly original, was also reliant on Western influence. Communities were encouraged to continue with their own activities, aided by carefully chosen, Western technological means. Even the way in which he presented the idea – helping others to do better what they were already doing – revealed the influence of Ruskin, who, incidentally, was already a strong influence on Gandhi. In short, notwithstanding Schumacher's openness, when discussing his ideas, the distinction between "North" and "South", or "West" and "East", must be used with caution. Ultimately, however, it is perhaps only by abandoning such geographical distinctions that the true originality of Schumacher can best be understood. For, in the final analysis, he was not a "development economist", nor even merely a practitioner of the dismal science. Ultimately, he is best regarded as a critic of *modernity*, inspired by a deep scepticism of the entire Western idea of science, industry and progress. This shaped his view of humanity, be it in the so-called First- or Third Worlds, and it provides the key to understanding both his bestselling Small is Beautiful and his little-known later philosophical work, A Guide for the Perplexed. His unique perspective allowed him to ruffle the feathers of the economic mainstream and be remembered as a prophet by an entire generation.

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