VIEWPOINTS

Viewpoints and Letters to the Editor are published in *HortScience* to provide members of the American Society for Horticultural Science an opportunity to share their experiences and comments on matters of concern to horticulturists. These are not statements of official Society policy nor do they necessarily reflect the views of a majority of the Society's members.

The Myth of Progress Forever[1]

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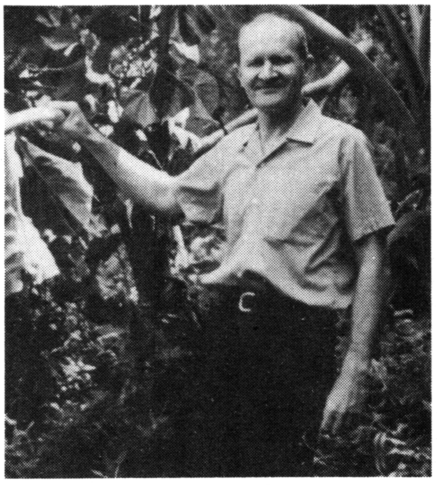

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What has happened in the field of agriculture in the United States during the last 50 years is unprecedented, unbelievable, spectacular, and commendable. During this period naturally good soils, favorable weather, development of varieties and techniques, and the massive use of energy have made North American farming the most productive ever known. Because of the rich yields obtained, the United States can be called the bread basket of the world, the sure source of abundance.

This success had lead to a myth that North Americans live and believe in. It is this: *Progress Forever.* This myth is expressed in Keynsian economics, the economic philosophy that growth *has* to occur.

But progress forever is impossible. Economic growth forever is impossible. This judgement is the recognition that our earth has limits. The earth is the cage in which the human race is maintained. We are rapidly using up the resources of the cage, and leaving the cage dirty. Eventually all of the capital resources, the non-renewable resources of this world will be exhausted. Long before they are exhausted the struggle to obtain a fair share will intensify. This will happen before the so called developing countries obtain full development, and indeed future development will only hasten the day. Eventually it will be necessary to change our ways of production from a high level of technology to an intermediate level. Whether these changes begin in 10, 100, or 1000 years is of little long term consequence to the species.

Intermediate or appropriate technology is a level of technology between primitive technology and advanced technology. It is the use of an appropriate level of technology, appropriate to get the job done, appropriate to conserve resources, appropriate to conserve and better mankind, appropriate to preserve long term human values, appropriate to maximize human happiness. Well, isn't that what it is all about? The ultimate goals of all scientists should be rooted in the well-being of the human race. So, in a sense, maybe that's what intermediate technology is all about, the use of technology that is good for us today, tomorrow, and forever.

But let me give you some examples. A modern sewage plant is high level technology. A backyard latrine is primitive technology. A composting toilet which uses no water, composts human refuse, produces a sanitary product useful as fertilizer, is intermediate technology. Another example: North American farming is mostly high level technology. In Papua New Guinea where primitive tools are used, one finds chiefly primitive technology. A well-designed home garden using the best scientific imputs is intermediate technology. Still another example: A city water system is high level technology. Obtaining water with a bucket from lakes and streams is primitive technology. A household cistern with water from the roof and gravity flow is intermediate technology.

In designing and using intermediate technology the findings of science are not neglected; they are used appropriately. It is not necessary to discard all of progress to use intermediate technology. In fact, intermediate technology is the making of progress without destroying resources.

Thus, intermediate technology or appropriate technology, first discussed by the noted economist E. F. Schumacher, is concerned in part with getting the job done. It is also concerned in part with how the job is done, and what other values are damaged or destroyed by getting the job done. The philosophy expressed by Schumacher is a moral philosophy. This makes an interesting contrast with the capitalistic philosophy, that the independent pursuit of personal material well-being will maximize the well-being of everyone.

High level technology contrasts with intermediate technology in the following ways:

High level technology	*Intermediate technology*
Complex	Simple
Difficult to initiate	Simple to initiate
Costly	Cheap
High imputs	Low imputs
High outputs per man	Low outputs per man
Consumptive of energy	Not consumptive of energy
Destructive of environment	Conservative of environment
Profit motive	Service motive
Inconsiderate of human values	Human values first
Reduces jobs	Increases jobs

It is apparent that malnutrition and underemployment are common in the world. So what do such people need and how does it relate to horticulture? Well, first they need to eat. Since they don't have money they need to produce food for themselves on their own small holdings. These might be subsistence farms, city lots, public rights of way scrounged or invaded, and even balconies of apartments, porches of shacks, corrugated roofs of shanties. The techniques should be good – the best that can be gleaned from modern science. The varieties should be appropriate, designed to live and yield over long periods of time. Pest control should not require purchased imputs, but simple techniques such as companion planting and preventive as well as curative measures. The techniques must be production techniques, not designed to make profits in a typical market, but to permit people to produce for themselves. Furthermore, the agricultural scheme should be oriented from a nutri-

[1]Remarks extracted from an address presented at the Intermediate Technology in Horticulture Symposium, 24th Congress of the Tropical Region, American Society for Horticultural Science, December 7, 1976.

tional standpoint. The object would be to produce nutritionally worthwhile foods. In this field of horticulture a great need exists for know-how and techniques. Sometimes the techniques are available in one place or another; sometimes techniques are self-evident and easily developed; sometimes techniques need new research.

When we progress in our thinking from the subsistence level to the level of the small farm we can see a great need for intermediate technology. The small farm can be more productive per unit area than the large farm—if treated right. There is already every incentive to treat the small farm right, but there is appalling ignorance among small farmers, and about an equal amount of ignorance among horticulturists. Furthermore the social environment might be such that the small farmer cannot be successful because of problems outside of his ability to resolve, including flood, drought, and pestilence, and such human oriented problems as land tenure, credit, marketing, and transportation.

One job of the horticulturist with respect to the small farmer is to introduce appropriate plant materials, those of which the small farmer can maintain his own seed, can manage using simple tools and a minimum of purchased input, can produce over a long period of time, can store for marketing convenience, and can transport to nearby markets with minimum loss of quality. The technology for these steps is intermediate technology, and needs much investigation in all fields, including horticulture.

It may not be sufficient for a horticulturist to produce, let us say, a new variety. To be useful a new variety must fit into a system. The responsibility of the horticulturist is not to change the system. that responsibility belongs to others. But it is the responsibility of the horticulturist to understand the system. If he does not, it is probable that his work will not be useful.

Should the horticulturist devote himself only to intermediate technology? Not at all. The horticulturist should be oriented with respect to human needs, and thus his output should be aimed at technology of various levels. But subsistence agriculture and small farming are emphasized here because these are the neglected areas, and these are the areas where intermediate technology is appropriate.

To study intermediate technology, you could visit:

The Intermediate Technology Development Group, London.
The Brace Research Institute, Quebec, Canada.
The Appropriate Technology Cell, New Delhi.
The Planning, Research, and Action Division, Lucknow, India.
The Appropriate Technology Cell, New Delhi.
The Industrial Development Division, Engineering Experiment Station, Atlanta.
The Volunteers in Technical Assistance, VITA, Mt. Rainier, Maryland.
The New Alchemy Institute, Woods Hole, Massachusetts.
The Division of Microprojects, Eindhoven, The Netherlands.
The Appropriate Technology Center, Islamabad, Pakistan.
The Technology Consultancy Center, University of Science and Technology, Jumasi, Ghana.
and The Agricultural Engineering Department, IRRI, Manila.

Some of the best of the publications available are:

Small is Beautiful, by E. F. Schumacher.
Appropriate Technology Handbook, by Volunteers in Technical Assistance.
First Steps to Village Mechanization, by G.A. MacPherson.
A Rural Development Handbook, by WIRUI Press, Papua New Guinea.

In addition several periodicals or journals are available:

RAIN, by the organization ECO-NET, Portland, Oregon.
Alternative Sources of Energy, a newsletter published in Maine.
VITA News from Volunteers in Technical Assistance.
Wind Power Digest, Bristol, England.

Thus, the entire idea of appropriate technology has its very serious side. The field of intermediate technology will grow rapidly during the coming years, and will come to be a very respected alternative to bigness. Horticulturists are going to be involved in it. It is very appropriate that the Tropical Region of the American Society for Horticultural Sciences, involved as it is with countries of all economic levels, recognizes that not all of horticulture has to be at the large and highly mechanized level that characterizes American agriculture. It is essential to know that food produced by subsistence agriculture has the same value as that produced by the most mechanized techniques.

LETTERS

Not Letter

Hybrid Spinach

During the fall term, I compiled, for my class in plant breeding, a list of the crops in which hybrid seed is used and the proportion of U.S. seed production that is hybrid for each crop. I was surprised to find that spinach at 68% of the production has the highest proportion of hybrid seed of any vegetable with the exception of sweet corn, and that even 10 years ago over half the spinach seed was reported as being hybrid. I had been intending to write Dr. R. E. Webb to ask about the procedure in producing this hybrid seed and before I got around to it, his article on this subject came out in *HortScience* (11(6): 546. 1976).

I want to commend Dr. Webb for writing this article that brings together much information about development of hybrid spinach and the people involved, information that could be lost if it weren't put on record in this fashion. It seems to me that this is a highly informative and interesting account of an important development in seed production. This is exactly the sort of article that seems to me is particularly well suited for *HortScience.*

H. M. Munger
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ASHS Time Change?

Recent experience with the ASHS editorial procedure indicates that the Society needs to adopt more unambiguous guidelines for abbreviations pertaining to time of day. Although abbreviations for morning (AM) and afternoon (PM) appear in the partial list of symbols for publishing in the *Journal* and *HortScience,* no such abbreviations are included for noon and midnight. Since AM is an abbreviation for *ante meridiem* (before midday) and PM for *post meridiem* (past midday), the logical symbol to designate noon becomes M (meridiem), or 12 M. However, this creates a dilemma for selection of a single letter symbol for midnight, which also might be M. One apparent solution to the problem would be to abbreviate noon as N and midnight as M, but this would create an even worse dilemma by changing the currently accepted meanings of AM and PM. Alternatively, one might adopt trivial two-letter abbreviations for midday (MD) and midnight (MN), but this also would be illogical since the component letters of AM and PM do not relate to those of MD.

The Council of Biology Editors (CBE) Sytle Manual encourages scientists in all disciplines to adopt the 24 hour clock as their time-keeping standard. In this system, time is indicated