A terrific book, but where's the science?

by Fletcher James

Plantwatching: How Plants Remember, Tell Time, Form Relationships, and More
by Malcolm Wilkins
Roxby Reference Books Ltd., New York and Oxford, England, 1988
224 pages, hardbound, color and black and white illus. with index, $29.95.

Malcolm Wilkins, Director of Life Sciences for the European Space Agency, has written an absolutely fascinating account of the internal structure and function of the plant kingdom. The book is profusely illustrated with magnificent photographs, microphotographs, and diagrams, most of which were produced by Mr. Wilkins himself.

The writing is clear and enjoyable—Wilkins assumes that his reader is intelligent and interested in the subject matter, but otherwise presupposes little direct knowledge of the subject matter, except for a passing familiarity with plants, and approximately a high school-level science education. It is organized into brief chapters, each explaining a specific aspect of plant life. When discussing specific aspects of plant structure, the accompanying graphics often include a series of microphotographs at increasing levels of magnification, plus parallel diagrams which help to clarify the contents of the photos.

At the level of "information," there is a tremendous amount to be learned from this book, which will be of interest to anybody who has grown plants in a house or garden, or who has a desire to understand the great complexities of living organisms. If you wish to grow plants successfully, you will find that comprehending the internal workings of those plants is a significant help; if you are an experienced gardner, you will probably find that this book systematically explains many things which you previously knew only intuitively.

At the same time, however, I was struck by the way in which the author, and the field of which he is a top-level representative, are horribly crippled by the collapse of classical scientific culture and science policy, which has been in effect for approximately 100 years, a collapse which has become increasingly rapid since the mid-1960s.

Let's start with some of the things I learned:

- The more primitive, seedless plants—algae, ferns, mosses, and liverworts—produce male and female spore cells, and often divide and grow into entire plants, before producing the cells (gametes) which combine to form the new generation of plants. The male gametes, like sperm cells in animals, must swim toward the ova. For this reason, such plants must exist in moist environments, where there is liquid through which to travel.
- The seeded plants are divided into two classes: monocotyledons (which include the grasses, cereals, and many familiar tropical plants such as palms and canes), and dicotyledons, also known as broadleaf plants, which include all of the temperate trees, the common garden vegetables, flowering plants, and so forth. In monocotyledons, the leaf veins extend from the base toward the tip, and the growth center of the leaf is at the base. This is why grasses can be extensively grazed or cut, yet continue to regenerate. On the other hand, the broadleaf plants have a branching structure of veins within the leaf. If you examine the plants you have around your home, you should find it easy to identify each variety.
- The process of photosynthesis (whereby plants use the Sun's energy to turn water and air into sugars and starch, and release oxygen into the atmosphere for the sustenance of animals and man), constitutes an amazing feat of engineering, which the author simply shows in diagrams and illustra-

tions. The structure and function of the photosynthetic process within a single cell is far more complex, and more efficient, than any energy system devised by man to date.

All plants also carry out the inverse process, known as respiration, to release this stored energy whenever or wherever photosynthesis is impossible (for example, in root cells, in seedlings, or at night). Respiration, which is also the fundamental process of energy production in animals, converts the stored energy of sugars into a half-dozen or so standard high-energy chemicals, which are then distributed to power all of the other chemical processes within cells.

- Plants possess a wide variety of mechanisms which allow them to sense and respond to their environment. This includes sensitivity to gravity, temperature, moisture, wind, and light. Many plants have the ability to sense the location of the Sun, and to move their leaves and stems continuously throughout the day, so as to ensure that the proper amount of sunlight is available to the photosynthetic processes. In addition, many plants exhibit extreme sensitivity to the length of day, which serves as the basic trigger on their annual growth and reproductive cycles.

One of the particularly interesting aspects of Wilkins's presentation is that, rather than simply describing what is known about the mechanisms of plant growth and function, he explains many of the experiments through which this knowledge was derived. For example, in the section of gravity-sensing mechanisms (which are required by seedlings to ensure that the stems grow up, and the roots, down), he includes a series of photographs from experiments done in zero-gravity Earth-orbit, aboard the Spacelab.

Wilkins closes his book with a chapter on genetic engineering, the modern technique which allows man to willfully alter the genetic patterns of plants, so as to produce new plant varieties, with any desired combination of characteristics. This technology will be crucial, if we are to develop new plants capable of surviving in a man-made environment on the Moon or Mars.

The tragedy of 'modern science'

At the same time, the dreadful state of "modern science," in methodological matters, shows up in two ways.

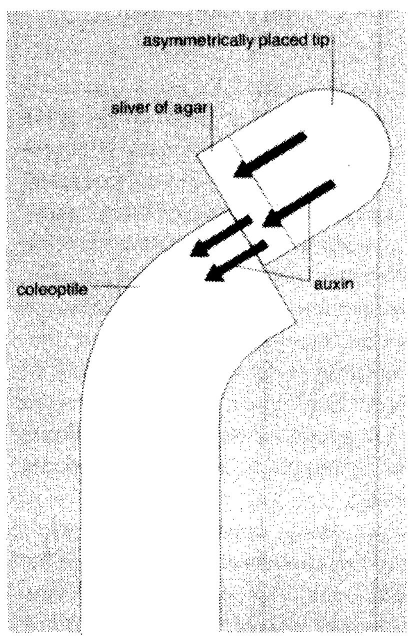
First, Wilkins's opening chapter includes an almost thoughtless, *pro forma* repetition of various slogans about how man pollutes, how more population means more pollution, and how we will all die if we don't control population. Obviously, Mr. Wilkins and his peers in the modern scientific community have never received a competent education in economics, which, as Lyndon LaRouche has pointed out, is the most exact of all of the natural sciences.

It is clear that Mr.
advancement of mankind. This is proven by both his desire to educate the lay reader and his promotion of the most modern means of agriculture to increase the production of food. Yet in spite of this, he passes along, in the form of "everybody knows that. . .," a bunch of anti-scientific garbage spread by the financial oligarchies committed to ending the progress of civilization as we know it.

Second, Wilkins seems oblivious to the fact that the very information contained in his book contains sufficient evidence to contradict every basic theory assumed true by "scientists" today. Were Leonardo da Vinci, Gottfried Leibniz, or Louis Pasteur around, they would wag their fingers at Wilkins, and point out what he and his peers have overlooked.

For example, take the question of how these plants evolved. The more we learn about the complexity of living organisms, the more it becomes obvious that there is no way that these processes could have been designed by the "trial and error" process postulated by Charles Darwin, and accepted by biologists today. A couple of billion years? A few trillion generations? God could play molecular dice for a trillion trillion years and still not invent a tree, if that were the Creator's method. So, why does Mr. Wilkins not raise the question of a creative principle at work in the universe? Because to do so would contradict the prevailing "theory" that the universe is fundamentally chaotic ("entropic"), and anybody who poses a different standpoint might offend and anger academia, as LaRouche has with his development of LaRouche-Riemann-Beltrami mathematical methods for dealing with negentropic processes.

Or, why ignore the geometric principles which govern the growth and structure of the individual plant? These were of great concern to Leonardo da Vinci, and Louis Pasteur. Perhaps it is because our scientists have kowtowed to the line that anything which cannot be reduced to "structure and mechanism," or statistical correlation, is not appropriate for publication in a scientific journal. And, if it is not publishable, then it must not exist.



This illustration from Plantwatching *shows that if the tip of a corn coleoptile is cut off (left) and stuck back on again asymmetrically, using a thin sliver of agar to hold it in place, the coleoptile will bend as shown. This indicates that a growth-promoting substance, auxin, is produced in the tip, passes into the shoot, and causes the cells on that side to grow.*

Or, why not follow Leonardo and Pasteur into examining the true role of the electromagnetic processes in the ordering of biological systems (a field known as "optical biophysics")? Is it because the evidence at hand might overturn every ruling assumption of physics? After all, you mustn't anger the physicists, they make nuclear bombs, you know.

Asking the fundamental questions

Great scientists make truly great and fundamental discoveries, because they are driven to ask great and fundamental questions. Lesser thinkers carry out an internal dialogue in the form of "I was taught X as *fact,* and I believe X as *fact.* Therefore, I would be greatly disappointed if X were proven untrue" (or, "How angry my peers would be, were I to question, or worse, disprove, X, which they all believe").

The philosopher Plato, in his dialogues, and the theologian Nicolaus of Cusa, in his *De docta ignorantia* ("Of Learned Ignorance"), like Lyndon LaRouche today, sought to recruit thinkers to the outlook of true science, and to provide them with the methodological tools and training required to generate a continuous stream of fundamental scientific breakthroughs. Plato and his predecessors created the Golden Age of Athens; Cusa and his co-thinkers, the Golden Renaissance. Thus, today our political movement must bring about a revival of their classical scientific culture, if we are to have the discoveries required to cure AIDS, feed the hungry, defend our nations, and conquer space.

So, read this book and enjoy it. But also, commit yourself to learning some real science: Pick up a few works by LaRouche (a good starting point is his "Beethoven as a physical scientist," published in the May 26, 1989 issue of this magazine), or Cusa or Plato or Leibniz. Read them five times if you have to, until they start to make sense. It will be worth it.

A new biography of Louis Agassiz

by Stuart Lewis

Louis Agassiz: A Life In Science,
by Edward Lurie
The Johns Hopkins University Press, Baltimore and London, 1988, 457 pages, paperback, $14.95.

Most Americans today may have never heard of the great Swiss-American scientist Louis Agassiz, but in the 19th century he had the stature to draw 5,000 people to a public lecture about natural history in America. A disciple of German natural scientist Alexander von Humboldt and a firm believer in studying the classics of Goethe, Schiller, and Shakespeare, Agassiz is well known for developing the theory of glaciation and the Ice Age. Among his many achievments were: numerous works on the recording of fossil fishes, founder of the Museum of Comparative Zoology at Harvard, one of the founders of the National Academy of Sciences and Cornell University, and the leading opponent of the evolutionary theories of Charles Darwin.

Lurie, like most people today, believes that Darwin's theory of arbitrary random mutation based on survival of the fittest, is correct and he has trouble accepting Agassiz's conception of natural law in a grand plan of the universe. While the book quotes a great deal from Agassiz, such as, "In the beginning the Creator's plan was formed, and from it He has never swerved in any particular. . . . To study . . . the succession of animals in time and their distribution in space, is therefore to become acquainted with the ideas of God himself," Lurie is compelled to add that this was a view Agassiz was never "entirely able to shake off." Agassiz described Darwin's theory as "a scientific mistake, untrue in its facts, unscientific in its method, and mischievous in its tendency."

In addition to leading the fight against Darwin's views, Agassiz was also part of a broader group of republicans interested in developing America, who called themselves "the Lazzaroni." The Lazzaroni "were ready with vast programs. They had ideas and innovations to propose; they looked toward the future; they symbolized a new approach to the organization of science in universities and the nation." Biographer Lurie also makes it perfectly clear that Agassiz's opponents on the question of Darwin were also the leading opponents of the Lazzaroni. "Significantly, opposition to the Lazzaroni stemmed from the same men who were Agassiz's opponents . . . Asa Gray and William Barton Rogers." They were "disenchanted with Agassiz as a research scientist."

For anyone interested in the history of American science this book should be read. It is well researched and gives enough background material on the period to give an idea of Agassiz's place in American science. But, one wishes the author had spent more time on Agassiz and the Lazzaroni's plan for development and not so much space on every boring detail of supposed scandal or backbiting incident by Agassiz's assistants. Lurie is also very sympathetic to Agassiz's major opponent on the issue of Darwin and evolution, Asa Gray, so much so that at times one wonders why he didn't write a biography of Gray.