

We should do more than be merely members of the A. Ph. A. We should give to it, our time, or means; yea even our prayers. How many here present know practically the last words of that great pharmacist, Albert E. Ebert, were words of affection for the AMERICAN PHARMACEUTICAL ASSOCIATION? Each of us should consider himself (or herself, since women have ever been as welcome in the A. Ph. A. as men) a committee of one to bring new members into the A. Ph. A. Each of us should aid our great JOURNAL in securing more advertising patronage. Each of us should feel a personal responsibility in aiding the project of our A. Ph. A. Headquarters, of erecting a building that will tell the world of the dynamic power of Pharmacy.

And then there is the A. PH. A. YEAR BOOK. Of course I cannot close this address without a reference to my early pharmaceutical love "the Handy Black Volume." Since I was a young man in a southern drug store, I have drawn much of my inspiration from the old A. Ph. A. Proceedings and their successors, the Year Books. When the call came to me to carry on the great task of editing this magnificent work, a task to which my venerated friend, C. Lewis Diehl, gave a greater part of his life, I assumed the position as a duty to pharmacy. I have been glad to perform this duty during the past six years and as I have worked upon the successive annual numbers I have realized as I have never realized before the great work that the A. Ph. A. has been performing all of these years in furnishing to pharmacy, not only of America but of the world, this pharmaceutical library in one volume per annum. Few but those in charge of the affairs of the A. Ph. A. realize in what high esteem the YEAR BOOK is held by pharmaceutical savants the world over. Few appreciate the sacrifices made by the A. Ph. A. in keeping aflame this torch of American pharmaceutical progress. In this endeavor, the A. Ph. A. should receive the support of all other pharmaceutical agencies of our country.

Enough, perhaps more than enough, has been said by the recipient of the Third Remington Honor Medal. In closing, he wishes to give his hearty thanks to those who by their ballots selected him for this supreme honor, to those, his friends of the New York Branch who planned this delightful evening and to those from neighboring cities who have come to spend with him the greatest evening of his life. May he leave with all present the thought with which he began this address; that since the dim ages of the past, pharmacy has been a calling of unselfish service and that to-day and into the dim reaches of the future it will continue a means of service, a useful art and a valuable division of science, if we pharmacists will only rise to the possibilities of our calling.

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### SOME FUNCTIONS OF BOTANY IN THE PHARMACEUTICAL CURRICULUM.\*

BY E. E. STANFORD.

Botany, as a science, had its origin with the beginnings of medicine and pharmacy. Botany, in its observational and experimental phases, dates even further into antiquity. All man's woe and weariness, says tradition, are the fruit of unfortunate

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early botanical adventure. How many gaps in the cave man's family circle may have been caused by unwise adventure with the Neolithic flora? Was the man of Neanderthal cut off in his prime by the luscious-looking berry of some prehistoric *Atropa*?

Early botany, medicine and pharmacy were almost synonymous. From Dioscorides, and the forgotten fathers before him, to the present century, almost, the triumvirate held close union. Modern medicine, wisely or not, has largely severed partnership with the vegetable science. Some form of botany, however, still maintains its position in most if not all of our pharmaceutical curricula. In this modern age of proprietary, of wholesale manufacture, of ubiquitous (would that they were) governmental inspectors, is this survival justified? Is this practice, founded when the apothecary brewed herbs from back-yard garden or nearby woodland, a survival of fitness or an obsolescent fossilism which in our modern specialization we should accord but a decent burial in this time when the druggist never sees the growing plant whose products stock his shelves? Built on technicalities, as science must be, is it but a skeleton of outworn technicalities which might well give place to some study more practical on the one hand, more cultural on the other?

What, then, is botany, and where does it find its basis? Our student, in that crucial moment of his career which decides his possession of an engraved certificate and the licensure of his profession, may define it simply as "the science of plants," and thus add a point or two to the hard-won total. If botany to him is this, and nothing more, then might we who teach the art best throw our dusty volumes into the darkest library corner and renounce our unearned stipends to endow a professorship of ornamental inks—a chair of show-card writing. If our lore be but the prattling of technicality—the rattling of dry bones in a drier valley of dusty jars and dustier definition—then let us pass, assured that our passing will be unregretted. If, to ourselves and to our students, our botany be a science of observation, a basis of accurate comparison, an open door to original power of thought and of action, a gateway to the measureless breadth of biological concept, an introduction, to the gifted few, to the infinite field of living research, then, and only then, may we boldly claim no secondary rank in the van of modern education.

What, then, is observation, that we should value it? It is the power to *see* necessary or momentous things that concern our life and its interests, to perceive their details—the meaning, moment, and relationship of those details, and their correlation into a whole. It may be, in large measure, contingent on interest, on evident relationship to the well-being or happiness of the individual observer. Some men see in terms of nations—of races; some in terms of universal space and of constellations. Some see in terms of atoms and of electrons. Some see in infinities; some in infinitesimals. Each, in the sphere of the other, might be a failure. Yet common to all ranks, to all who in the forefront of their own chosen life work would leave life richer than they found it, must be this basal power of observation—this power for the necessary moment to focus all perceptive senses intelligently on any thought or any thing which occasion may require. If we consider the pharmacist merely as a technician—a technician, be it remembered, on whose technique the lives of other men depend—can we overrate the importance to him of a highly developed, intense command of the power of observation?

Does our modern environment of the young—our hurried secondary smattering of hasty rhetoric, hasty history, ancient and modern, hasty pursuit of dead languages slain twice again by haste—our modern vicarious recreation by hasty pictures of the trials and passions of a lifetime shot in breakneck brevity on the screen—our hasty mad cheering of physical convolutions of the hired men of the diamond, earning more than a university president's salary apiece—does all this develop observation, perception, concentration, capacity for steady, continuous, painful effort of any kind?

How far have our students, as we get them, developed a power of observation which can be concentrated on a thing which, for the moment, does not particularly interest them? No single test will show. Some, however, are indicative. Take a dozen students from any entering college class. Ask them, without special caution, to copy—not memorize, but simply copy—a dozen unknown terms of more than average difficulty—a dozen official Latin titles, say. How many, judging from the result, could—or would—copy a simple prescription with letter-perfect, absolute correctness? Take the bulb of a common onion—a simple subject in gross morphology, if such a thing exist—and ask your dozen students to draw it with accuracy. Nature drew the fibrovascular bundles—the ribs, to use more common language—from apex to base with an accuracy almost geometrical. How many of your chosen dozen will depict an object striped parallel-wise like Old Glory hanging downward? Try it and see! How many of the same or any other dozen would draw the simple leaf of the apple or maple without projecting the veins, like aberrant trichomes, somewhere over the edge? Lack of observation? Carelessness? Which is cause? Which effect?

How may botany, taught as a science, develop this power of observation? One recalls an old term—an unpopular term in any connection now—which used always to be used in definition of science—discipline. One thinks of Agassiz, greatest of teachers, who spent a term or a year on the details of a single fish, on that single basis laying the foundations of careers of research and service. The great master lived sixty-seven years. How long could he have stood the “pep” and “hustle” and “jazz” of to-day? One wonders.

For a professional training one could perhaps draw no brief for such super-intensive system. But a training for any profession must begin with some intensive discipline in the seeing of common things. The practice, old as the science and new as its needs, of careful drawing here lends its aid. There is a world of mental and physical discipline in the accurate depiction of a simple complex like a root or stem or leaf.

As to comparison: In comparison observations meet, mingle, adjust and perfect themselves. If objects in botany be seen, or drawn, with reference to themselves alone, with no noting of similitude and difference, no reasoning as to the *why* of resemblance and divergence, our observational beginning, valuable as it is, is a beginning only. Comparison must follow observation as night follows day. Accuracy, born of observation, perfects itself in comparison.

What of initiative? We read; we memorize the labor of other brains. We think the thoughts of other minds. We reap in peace the fruit of other men's pain. And it is well that we do. All progress bases itself on the past. To-day is built on yesterday. Structures of to-morrow must be founded to-day. But no educa-

tional scheme can be a well-rounded success unless it develops in a definite way on the foundations of observation and comparison the ability to think and do for the self.

The operations of the botanical laboratory, even of the compound microscope, or of the outdoor work and garden which should be an obligatory part of a botanical course, are simple, yet exact. The conclusions to be drawn through observation, comparison and operation are not always simple, not always obvious. Who is to do the thinking, who expend the mental effort, that derives complex truth from fundamental simplicity? How often, in desire to teach, to express our outlook, valued because it is ours, in desire to secure rapid development in the student who is ours for so brief a time—how often do we teach facts and words merely? How often, by endless repetition, by constant quizzing, by tireless though weary minuteness of supervision, in our desire to get something expressible in grades of figures as an earnest of progress in whatever specialty our work may lie—how often by a thousand well-meant, ill-planned means do we step in and dwarf and cripple and hinder our charges' necessary self-development?

That biological outlook. Where does the "barefoot boy" of to-day get his concept of the workings, of the ramifications, of nature? The "bending orchard trees" of his disrespected rural grandparent have for him been replaced by a pushcart. "A primrose by the river's brim" is not a primrose even; if he classify it at all, he may name it vaguely a dandelion. When a teacher has been asked, in all seriousness, "Which grows on the outside of the tree, the wood or the bark?" he begins to realize—or try to realize—the modern biological concept of the city-bred youngsters who swarm into our schools. Where may such a student, himself a living organism, learn the basic laws that govern life as we know it—the fundamental functions, adaptations, and nature of the living thing, be it plant or animal? In all our pitifully brief pharmaceutical course, where else but in the study of botany? Not in laboratory or lecture only, though neither must be neglected, but there are times in the botanical course where a single trip in a city park is worth a dozen inside periods, and a half day in even a rudimentary pharmaceutical garden worth a hundred.

What of research? The world to-day is one vast research laboratory. Our sciences in a day have sprung from the darkness of a million yesterdays. Tomorrow—never may it have been so well said that we know not what the morrow may bring forth. And if in the bringing forth of things and thoughts that make tomorrow's world nobler and fairer than to-day's, students of ours may bear a part, if in the dawning sunlight they see clearly where our vision is but veiled, if new discoveries which make the pains of illness lighter and the burdens of life more easy to be borne, may owe their inspiration to toil of ours, then may we who teach a living science rest assured that our science and its interpretations have proved their worth to pharmacy and to the world.

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