

the separator present the appearance of an emulsion, add 5 cc. of a mixture of glacial acetic acid and water (3 parts of the former to 2 parts of the latter), shake for thirty seconds, and set aside until the acid liquor has completely separated. Draw off the lower layer into a small beaker, and again agitate the ether solution with 5 cc. of the dilute acetic acid of the B. P., and draw off as before. To the united acid liquors in the beaker, add dilute sulphuric acid in excess, stir well, and allow the sulphate of lead to subside. Filter and wash lead precipitate with distilled water until a drop of the filtrate gives no precipitate with Mayer's Reagent. Concentrate the washings to a small bulk, and add these to the contents of the separator."

The remainder of the process consists in following the usual procedure of making alkaline with ammonia and extracting with chloroform. The chloroform extract is purified by shaking with dilute hydrochloric acid, and then neutralizing this acid solution of the alkaloids with ammonia and extracting with chloroform. The chloroform residue is dried and weighed.

Frank X. Moerk published a method for the assay of the *Emplastrum Belladonnae* U. S. P., 1890, in *The American Journal of Pharmacy*, March, 1899. In this method sulphuric acid is used to convert the lead oleate into insoluble lead sulphate and also to liberate the fatty acids from the soap, thus eliminating these two ingredients. The author used a few milligrams of stearic acid to overcome the persistent emulsions formed when extracting the alkaline solution with chloroform-ether mixture. He found that the stearic acid did not interfere with the accuracy of the results.

The difference between the assay process for plasters containing lead oleate and soap, and the present official plaster which does not contain these ingredients, is the procedure involved in getting rid of these interfering substances. This was accomplished in the different methods by the use of sulphuric and acetic acids. The present U. S. P. method of assay is designed to eliminate the rubber, so that the belladonna alkaloids may be more readily and completely extracted. Although the final object sought is the same, the methods must of necessity differ according to the interfering substances present. Also the judicious use of the miscible solvents eliminates to a great extent the troublesome emulsions.

CONCLUSION.

The alkaloidal standard for Belladonna Plaster adopted by the United States Pharmacopœia, Revision IX, has proven satisfactory, and is quite in conformity with the leading Pharmacopœias of the world.

The assay process found in Revision IX, U. S. P., with the very slight modifications suggested, will be found to give satisfactory results.

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WHY BOTANY AND PHARMACOGNOSY?

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Some time ago, while entertaining two brother-pharmacists, one of them asked—"Why lay so much stress on Botany and Pharmacognosy in the colleges of pharmacy? Doctors are not prescribing crude drugs and very few of their preparations. It seems a waste of time to require students to study Botany and

Pharmacognosy." With the foregoing question continually in mind, because matriculants ask it also, the title for this paper was not hard to select.

It seems to me as though the majority of students come to our colleges of pharmacy prejudiced not only against this particular subject, but also against a few others. The root of the trouble seems to have started while the student was under the tutelage of a preceptor who experienced some particular difficulty, either fancied or real, in making the required passing grade. Then again, the student seems satisfied with the Botany taught him in the regular High School course. This fallacy is easily dispelled by the professor or instructor by giving a brief examination of the fundamentals required, on the first or second day of the opening sessions. To the chagrin of the professor he will find that potatoes grow on trees and that the microscope is used to look at and count stars.

Were it possible to receive open-minded students the teaching of the subject would be half accomplished. The student acquires the impression that his teachers are not human beings and gets the idea that some demon is hard at work in strewing his otherwise successful college career with insurmountable barriers. Given then a student who is open to conviction and who is not afraid to exert himself in attaining a broader education, the happy medium is attained. He will find others just as human as himself, who, instead of trying to flunk him at every turn, are always ready to extend the helping hand in making the learning and thorough study of this particular subject and its application so clear that its significance cannot be missed.

The study of Botany in a college of pharmacy during the first year of the course is necessary as a foundation for the successful study and perusal of the advanced subject, Pharmacognosy. During the study of botany the student becomes acquainted with the fundamental considerations and structures involved in plant life, at the same time he learns the correct use of another valuable asset, the compound microscope. Remembering then that the height of the pinnacle is determined by the breadth of the base, pharmacognosy is either offered in the second or third year of the college course. If the foundation or the study of botany has been built upon a solid base, the pinnacle or the study of pharmacognosy will rear itself with incredible speed. On the other hand, if not enough attention has been focused on the study of botany, the study of pharmacognosy is so much more difficult.

Another seeming cause for dissatisfaction is the nomenclature involved, the student being required to learn a vocabulary different from the one learned previously. Recently, much has been said about humanizing the study of these subjects by dispensing with the various descriptive terms which facilitate their study. Instead of simplifying the matter it would become more difficult because of the helpless jargon one would find himself in, when asked to describe or define a certain drug. Instead of using the right term, five to ten simpler words would be used, all erroneous and unsatisfactory. The greatest humanization which possibly can be undertaken is that which binds the student and his professors or instructors so close that each will endeavor to do his share by active coöperation with the other, on the work in hand.

The following are the reasons why botany and pharmacognosy should be studied and how the pharmacist may apply the knowledge acquired:

(1) A broader knowledge of nature will naturally follow, making one realize that plants as well as animals live on this earth.

(2) In some localities the use of crude drugs and spices seems to have dwindled perceptibly because the pharmacist has not taken enough time to prevent their becoming worm- or insect-eaten. The wholesaler and jobber usually supply drugs in first-class condition. The pharmacist, who has had a thorough course in pharmacognosy, at least knows how to keep his crude drugs in a salable condition and does not suffer a falling off in sales or profits.

(3) Many pharmacists are handing over their spice trade to the neighborhood grocer. Recently seven prosecutions took place. In each case Carthamus was sold when Crocus or Spanish Saffron was called for. Happily all concerned were grocers and not pharmacists. The fine in each case was \$60.00 plus costs for the first offense and up to \$1000, plus costs for the second.

(4) Pharmacists located in foreign-settled communities still have and always will have calls for crude drugs as long as they keep them in a salable condition. Statistics indicate that many thousands of dollars' worth of crude drugs are being imported annually into this country. So why not reap some of the profits that others, probably more enterprising, are reaping?

(5) Physicians often consult the pharmacist about the medicinal value of certain crude drugs. If the pharmacist is not acquainted with the drugs he sells he certainly loses valuable talking points, at the same time leaving an element of doubt in the mind of the physician as to whether that particular pharmacist is qualified to fill his prescriptions. Hence, the pharmacist cannot afford to be ignorant from either a financial or an ethical standpoint.

(6) The U. S. Department of Agriculture is always in need of men qualified to carry on drug inspection work. As a preparation for this work, a number of colleges of pharmacy are offering courses in Advanced Pharmacognosy and Technical Microscopy besides the required courses in Botany and Pharmacognosy.

(7) Positions are available with wholesale drug concerns for men qualified in the proper handling and identification of crude drugs.

In conclusion, the pharmacist who has a working knowledge of Botany and Pharmacognosy is better qualified to uphold the food and drug laws and needs to have no fear of continued prosecution for selling crude drugs and spices which furnish him a valuable source of revenue.

ABSTRACT OF DISCUSSION.

Heber W. Youngken expressed his appreciation of the paper. The author's summary of profit from the subjects had been clearly stated, and he added that the study of Latin and Greek is largely for developing the powers of concentration. In his opinion no subjects are better suited for this development than botany and pharmacognosy—they widen the student's power of observation.

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