

AN OPPORTUNITY AND A CHALLENGE TO PHARMACY
EDUCATORS.*

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The reports of the Committee on the Costs of Medical Care suggest that the public must choose between the socialization of medical care with its bureaucratic regimenting and inflexibility; or that private service must be developed to be more effective and more economical. The trend of the report is an accusation that the affective value of the service is not commensurate with the cost of the same.

Pharmacists may well be pleased with this report in its statement that as instituted "the services of the pharmacist are readily available to the public without unduly high cost for the prescribed medicines" and in the recommendation that "the preparation, standardization and distribution of drugs, medicines and medical supplies should be limited as far as possible to pharmacists who are prepared by education and training to render this responsible service and to protect the public against abuse."

As affecting pharmaceutical education we find:

1. That more stress should be placed on the pharmacists' responsibilities and opportunities for public service;
2. There are enough, if not more than enough colleges of pharmacy teaching undergraduate courses but there are very few giving graduate work;
3. The education should be more closely correlated with the education in other public health professions.

In the past years the member presenting this paper has introduced different phases of two fields for pharmaceutical endeavor sadly neglected by the profession in America—two phases which have much to do with meeting the issues raised by the report of the Committee on the Costs of Medical Care.

The first of these is "Hospital Pharmacy" which happily is on the road to correction by the recognition of the needs for adequate pharmacy service in the hospitals and by the inclusion of a clause to that effect in the standards set by the Council on Medical Education and Licensure, of the American Medical Association.

The second subject, that of clinical laboratory service, is now of more vital interest and importance than ever for the following reasons:

1. The days of the side-line expansion and diffusion of the upkeep or cost of pharmacy establishments has reached a point where it has not only ceased to be an aid to rendering of pharmaceutical service but has become much of a discredit and a detriment to the profession of pharmacy. Many of these activities now so overshadow true pharmacy as to be injurious to the public interests;
2. The recognition of pharmacy's place in the hospital group makes it imperative that our pharmacy faculties take steps to prepare pharmacists and pharmaceutically educated personnel capable of filling these positions efficiently;
3. The reorganization of pharmacy education to a full four-year undergraduate course puts the challenge to these faculties to shape graduate courses to meet the advances in pharmacomedical practice in keeping with the times.

Many phases of this subject have been brought to the attention of the members of this ASSOCIATION during the past fifteen years.

* Section of Education and Legislation, A. P. H. A., Madison meeting, 1933.

In 1919, a paper was read before this Section on "Pharmaceutical Education and Opportunities"¹ to focus attention upon the subject of clinical pathology and its relation to pharmacy. It endeavored to show that it is a branch of the medical arts and sciences which requires a greater chemical and pharmaceutical knowledge than is required for the practice of general medicine and surgery. That it should, therefore, be classed in the group with pharmaceutical medicine along with pharmacology and pharmacy proper, and should receive greater consideration by colleges of pharmacy giving advanced courses.

In 1921, before the Section on Practical Pharmacy and Dispensing, a paper was presented on "Clinical and Pathological Laboratories—Their Maintenance, Service Charges and Scope of Work."²

In 1925, a paper on "Combined Pharmacy and Clinical and Pathological Laboratory Education"³ was presented before this Section. This reviewed and discussed the various combined courses for medical students and particularly discussed and questioned the value of the course combining pharmacy with medicine offered by the University of Michigan.⁴ It also dwelt upon factors pertinent to the costs of medical care; the economic factor of the high cost of medical education and training in dollars as well as in the important sociologic factor of the many unproductive years of the physician's life, and it questioned the value of much that is crowded into the medical curriculum. The paper called attention to the loss to society if the so-called preclinical courses of the medical curriculum were further curtailed and the detrimental effect of this on the laboratory branches if no other arrangements are made to preserve these utilitarian subjects to society.

It pointed out that the pharmacy faculties in university schools are the logical ones to take the initiative to develop these branches. In contrast to the students of medical schools it will be found that the students who enter a first-class pharmacy school for the more extended courses are of a temperamental and mental type which makes for success in the tedious work which characterizes most laboratory activities.

Likewise, the grilling chemistry and related courses as given in the pharmacy school are more directly applicable for this type of work than are the very limited courses given to prepare medical students or the general chemistry of many universities. To properly qualify advanced pharmacy students to become expert in the clinical laboratory service requires careful planning and selection of courses.

The experimental physics courses for such students should be extensive. Where a comprehensive general biology course and an extended experimental pharmacology course are available, the anatomy and dissection courses of the medical school are not necessary as the laboratorian of this type does not need the regional precision in human anatomy required of the physician or by the surgeon.

The bacteriology should be developed in the pharmacy school, as a much more extended course should be given than is required in medical schools. The tendency in recent years has been to abridge the normal and pathological histology courses in the medical schools. For this reason and for the needs of pharmacological research

¹ H. J. Goeckel, *JOUR. A. PH. A.*, 8 (1919), 930.

² H. J. Goeckel, *Ibid.*, 10 (1921), 182.

³ H. J. Goeckel, *Ibid.*, 14 (1925), 48.

⁴ Edward H. Kraus, *Ibid.*, 13 (1924), 353.

training it will be advisable for the schools of pharmacy to develop their own courses in these subjects. Much experimental animal histology and phases of drug action and toxicity can thereby be stressed. The general embryology in the general biology is ample because the pharmaceutically trained student is well versed in plant histology and plant embryology.

In the 1925 paper, the view was expressed that the clinical pathology course of the medical school would possibly be better than a course at the pharmacy school. My experience since then and the advancement in the pharmacy curriculum lead me to decidedly revise this view. The courses at the medical school are probably adequate for medical students but they are far from satisfactory to prepare laboratory experts. The subject will have to be developed by the pharmacy school and correlated with the courses in bacteriology, histology, pharmacology and physiological and organic chemistry.

Placing this branch of laboratory service in the pharmal group and preparing a truly qualified group of laboratorians will tend to prevent the laboratories of our hospitals being used as a makeshift by physicians until the opportunity presents itself for them to enter general practice. This is one of the banes of the laboratory service, as comparatively few medical men take up the service with the serious intention of making it their life's work. The result is that they usually employ it as a stepping-stone and never thoroughly qualify or devote their attention to the work.

The greater part of this work is at present in the hands of mechanically trained technicians. Every community with two or three "real" physicians can support such a laboratory organization. By "real" physicians I mean the general practitioner who makes thorough and careful examinations of his regular patients and keeps careful cumulative histories on each one; in distinction to the type which I call a "Medicine Man." This will furnish the means for the "real" physician to get reliable aid to alter, to extend or to refute his tentative diagnostic conclusions, and also aid in checking up on case progress. It will place in each community a unit which many times furnishes the key to the physician in deciding whether or not to send the patient to a consultant, to a specialist or to a hospital.

It will greatly aid the medical profession to meet the challenge of socialized medical care with its roseate promises and its inherent evils.

As affecting the laboratory service:

It will place the service in a distinct class where it will not be subject to the abuse of being utilized as a mere stepping-stone to medical practice.

Through having thoroughly educated and trained expert laboratorians the service will be greatly improved and extended.

It will afford a better means of establishing efficient hospital service than is at present possible.

It will help to coördinate the medical, surgical, nursing and pharmacy service of the institutions.

This combined pharmacy and clinical laboratory education is one in which the subjects supplement and fortify each other and thereby greatly extend the value of the laboratory units.

As affecting pharmacy:

It is the one specialty which coördinates all other types of pharmal service and is the only field giving direct sympathetic contact with the physicians.

It can be combined with professional pharmacy to pharmacy's and to the public's advantage as it will afford opportunities to detect the shortcomings of the pharmaceutical services.

It makes possible the maintenance of laboratories in smaller communities and enables these specially qualified pharmacists to take advantage of their analytical training in chemistry and in the other branches of the pharmal field.

Such laboratories can at times take over the routine control analysis of smaller industrial establishments. Where it is combined with a pharmacy, this will often become a special purchasing unit of the industrial establishment thereby increasing the volume of business in rapid turnover items. It will often be the local health control unit thereby extending pharmacy's public health service capacity. Most physicians in the writer's service submit the diagnostic nose and throat swabs in suspected diphtheria cases to him and his associate and then send the release cultures to the State Laboratory.

This education and training will provide a more satisfactory group of pharmaceutical chemists for teaching and for manufacturing and for biological positions. As specifically affecting the public:

It will improve and spread the laboratory service and by its coördinating effects it will improve medical and pharmal service.

It will extend pharmacy's control right to the use of the medicaments

The writer is many times sought by and goes into conference with his medical clients in selecting the remedial measures to be employed in given cases. He is repeatedly requested by many physicians to criticize their therapeusis when the laboratory examinations indicate errors or abuse.

By this advance the pharmaceutical profession can pledge still greater advances in the value and quality of the pharmaceutical services beyond that disclosed by the very favorable report of the Committee on the Costs of Medical Care.

The challenge is up for the pharmaceutical faculties of America to make this come true.

ABSTRACT OF PAPER, SCIENTIFIC SECTION, A. PH. A.

"Two Species of the Genus *Ledum*," by Russell A. Cain and E. V. Lynn.—A preliminary study of *Ledum groenlandicum*, Oeder, having shown very interesting composition, a more extensive investigation was made of the leaves and of the flowers of this and of *L. columbianum* Pip. After a partial proximate analysis, during which the absence of alkaloids was noted, the volatile oils were more carefully examined. The fresh leaves of *L. groenlandicum* yielded 0.12 to 0.18 per cent of oil which was found to contain about: 25 per cent of *l*-borneol, partly as acetate; 25 per cent each of *l*-alpha-phellandrene, *l*-alpha-caryophyllene and ledum camphor; a smaller quantity of phenols, chiefly carvacrol; some free acetic acid and possibly other acids of higher molecular weight; probably some azulene. The fresh flowers gave 0.058 per cent of oil which had strikingly different constants. The fresh leaves of *L. columbianum* yielded 0.55 per cent of oil containing about: 3 per cent of *l*-alpha-pinene; 15 per cent each of *l*-borneol, partly as acetate, ledum camphor and an unidentified terpene, probably *l*-beta-pinene; 10 per cent each of *d*-alpha-phellandrene, *l*-alpha-caryophyllene and columbenol, a stearoptene, probably C₁₅H₂₂O; a small amount of phenols, chiefly carvacrol; some free acetic acid and possibly traces of other acids of higher molecular weight; probably some azulene. The fresh flowers gave 0.59 per cent of oil with notably different constants.

Contrary to previous opinions, none of the overground portions of either plant was found to be poisonous to animals, even when given in enormous doses. No evidence could be found for the presence of arbutin, which had been claimed as a constituent of *L. groenlandicum*. The glucoside, ericolin, may be in the leaves of both species, as attested by hydrolysis to ledum camphor, but since no one has ever isolated the glucoside in a pure state from any vegetable source, one can conclude only that there is present in the species of *Ledum* a substance which hydrolyzes to ledum camphor.