

failed to receive benefit from their use, were held as official secrets and could not be imparted to the Commission.

Other leads which at first appeared promising on further investigation proved to be equally disappointing; that is, the persons claiming to possess such knowledge either revised their statements when asked to make them more definite, or claimed to possess their information in a confidential way, and were therefore unable to give the Commission any specific data by which independent investigation could be made.

As the Commission has not been able to verify any of the alleged cases of injury resulting from the use of proprietary remedies, it does not feel justified at present in reporting the names of the preparations concerning which complaints have been made.

The Commission intends to continue this particular part of its investigation during the coming year, and hopes to be successful in obtaining some accurate information upon the subject in time for its next report.

Other studies of special features of the matters assigned to the Commission for investigation have been initiated during the past year, or have been continued from former years, but are not sufficiently advanced to report upon at the present time. Some delays have been unavoidable owing to the much-regretted deaths of two of our most active and valuable workers, Messrs. Wilbert and Main, to whom the duty of making several special studies was entrusted. It is hoped that by the time of our next annual convention these subjects will be in better form for presentation to the Association.

Respectfully submitted,

J. H. BEAL, Chairman,
CHAS. CASPARI, JR.,
JOHN C. WALLACE,
W. H. COUSINS,
SAMUEL C. HENRY.

GRADUATE INSTRUCTION IN PHARMACY IN THE UNITED STATES.*

BY EDWARD KREMERS.

When in 1821 the "School" of the Philadelphia College of Pharmacy offered its first course of evening lectures to the apprentices of Philadelphia, the first step toward the realization of systematic instruction in pharmacy had been taken. No doubt, this early experiment in continuation work reflected a need that had been felt by those who had given the subject any thought whatever. In part, however, it must be looked upon as a counter movement to the proposed step toward pharmaceutical education contemplated by the Medical Faculty of the University of Pennsylvania. As an assertion of professional independence it was highly to be commended. Viewed from the point of view of Peter K. Lehman,

* Presented before joint session of Section on Education and Legislation, A. Ph. A., of the American Conference of Pharmaceutical Faculties and National Association of Boards of Pharmacy, Indianapolis meeting, 1917.

who expressed his commercial ideas in the following words: "This won't do, the University has no right to be taking our boys away at noon to make them M.P.'s," it was equally to be regretted. It would be useless, however, to discuss now, almost a century after this memorable event, what course pharmaceutical education in this country might have followed had a great university taken the initiative instead of leaving this important first step to men who saw in their apprentices, not so much the future pharmacists, as means to an immediate end.

For many a decade the road of the more ideally inclined members of the newly organized colleges was not an easy one. When, in 1789, the French apothecaries changed their organization from that of a guild of apothecaries to that of a college of pharmacy, they thereby declared to the French people that they wished to be regarded as a body of professional men and no longer as a guild of trades people. In this, their decision, they received the approval of their king. When the Philadelphia druggists in 1821 organized first as a College of Apothecaries—the name being changed very soon to that of College of Pharmacy—they likewise declared to the new world that they desired not only their independence of medicine, but that they were willing to assume the educational responsibilities of a profession. How lightly this obligation was taken by most of the members becomes apparent from the long list of those who dropped by the way as soon as the efforts of the medical faculty had been frustrated, and from the short list of names of those who were determined to strive toward the goal.

The beginnings were modest indeed. A single course of evening lectures by several medical men was all that was attempted. Pharmacy had declared its professional independence of medicine, but it had to call upon the older sister profession for its teachers. If the difficulties in Philadelphia were great, in other eastern cities, where local colleges were incorporated, the attempts either failed in large part, or, as was the case in Boston, no serious attempt at instruction was made at all for a number of decades. No wonder that the endeavor to secure educational coöperation in the first Conference of Colleges of Pharmacy did not outlast a decade.

If, in 1821, the somewhat grandiose attempt to initiate pharmaceutical instruction at the University of Pennsylvania met with failure, the small beginnings made by the University of Michigan in the sixties were more successful and gradually led to the movement, now all but universal, of pharmaceutical education by the state. Great as were the sacrifices made by such men as Squibb and others who gave not only their time and energy, but their money as well, the effort of the individual could not equal the effort of the state demanded by its druggists and supported by the entire citizenship of tax payers.

Whereas the evening courses at Philadelphia and elsewhere were of the type of the German *Fortbildungsanstalten*, after which our quite recent continuation schools are modeled, Michigan demanded the entire time and attention of her pharmacy students and made laboratory instruction the most prominent feature of the curriculum. Though Michigan was not admitted to the first Conference, yet her educational system prevailed, whereas the Conference was broken up. State university after state university has entered the field of pharmaceutical education with laboratory instruction as its backbone, and college after college has

slowly, but with resolve, added, first one modest laboratory course, then another, until laboratory instruction has become firmly established in all of them.

When the state universities entered the field of pharmaceutical instruction, they did not place the pharmacy student on a par with the regular students of their colleges. The entrance requirements were of a lower order, the time required for the completion of the course was shorter by half and even more than the conventional quadrennium. It is true the older colleges of pharmacy had no educational entrance requirements whatever, and even when the evening work was gradually displaced by day work, the actual time required was much less than that required by the universities. However, the prevalent university standards of pharmaceutical education suffered by more direct comparison.

The third step, *viz.*, the one to offer to the American student of pharmacy a course on a par with the conventional A.B. course of our colleges and universities was taken in 1892. It was received with much ridicule by the professors of the older colleges and did not even receive the condemnation of faint praise by the university teacher who had taken the very important step of placing pharmaceutical instruction on a thorough laboratory basis. However, it persisted, though in but a small way. Intended primarily as an ideal, it was soon found practical. More than ten years ago a university president referred to it as the only course to which every prospective pharmacist should aspire; a college dean has more recently heralded it as the salvation of pharmaceutical education in this country.

Thus was laid the foundation for graduate, not post-graduate work, in pharmacy. The subject of post-graduate study may be an important one, but it is not the topic of this paper. By graduate study is meant that type of educational work which is recognized as such by both the Association of American Universities and the Association of State Universities. Just as the quadrennium of the college rests on the four years of high school or academy, so the triennium of graduate study is based on the quadrennium of the college. As the work of the college implies something more than work done after the high school has been absolved, namely, study of a higher type, so graduate work implies something more by far than a continuation of study on an undergraduate plane after the coveted bachelor's degree has been received. Graduate study stands for work of the highest order given in course by the highest institutions of learning in the country.

Such work could not develop over night. It is not sufficient to map out a three years' course of study on paper. Just as the old colleges, when they inaugurated the evening courses for their schools, found that they could not supply the instructors from their own ranks for the modest courses of lectures, so the undergraduate college, not only in pharmacy, but in all lines of human endeavor, found that teachers for graduate study had first to be trained. This training was had—again in almost all lines—mostly at European universities. As France gave American pharmacy the college idea, *i. e.*, the closed corporation of the masters of the profession; as England gave us the idea of the classical college; so Germany gave us the idea of professional education in all branches and grades by the state. Moreover, she gave us the highest type of education, that which we in this country choose to designate graduate study. Hence it was in Europe, and more particularly in Germany, that not a few of our scientists received at least the final touches

of their higher education. Pharmacy constituted no exception to the rule. It is needless to state that just as not a few old-time self-made druggists were also good pharmacists, so individual teachers of pharmacy were imbued with the spirit of research, the basis of the graduate teachers' instruction, without crossing the Atlantic. Foreign journals and other publications kept alive the spark which their own individuality had kindled within them.

It is significant that the origin of graduate pharmaceutical instruction had its beginnings in the collateral sciences rather than in pharmacy proper. To anyone who has followed the trend of pharmaceutical education in this country this becomes readily apparent; and, in the light of the historical development of pharmaceutical education, it is easily understood.

Now, what should constitute graduate instruction in pharmacy?

When your speaker matriculated in the Philosophical Faculty of the University at Bonn, he was requested to inscribe his name in the Album of that faculty and the dean thereof extended to him the right hand of fellowship. The significance of these symbolic acts is this, that the student of the graduate faculty is regarded as the junior associate of the professor. The relation is no longer that of teacher and pupil, but of joint seekers after the truth, the professor being the senior, the student the junior member of this partnership. It is that of master and disciple, such as obtained in Aristotle's academy; not that of master and apprentice, a relation that obtains in the trades. It is this relationship that is characteristic of graduate work as contrasted with that of undergraduate study; though it may be necessary to emphasize that there are no hard and fast lines in study any more than in nature.

The relationship, however, is not likely to be that of one disciple to one master teacher; it is not that of a Mark Hopkins at one end of the log and a student at the other end thereof. The best opportunities for graduate work are not even found in the isolated college, but in the *universitas litterarum* with its diversified interests the aggregate of which creates the graduate atmosphere. It is the seeking of truth along many lines that stimulates the seeker of truth along the one line of endeavor to which the human being is of necessity largely restricted.

Referring primarily to undergraduate instruction, the late President Bascom, in "Things learned by living," makes the following statement: "There seem to me to be four primary qualities in good instruction, the power to impart information, the power to guide the pupil in his acquisition, the power to awaken the mind to a love and mastery of knowledge, and the power to disclose the essential unity and composite scope of truth. The professional necessity sinks from the first to the last, the personal inspiration rises from the beginning to the end. The lower excellence can hardly be secured without some measure of the higher, and the higher ceases to be permanently fruitful without a large measure of the lower."

Add to these four qualities the power to guide the student in the search for truth, also a stimulus to create an abiding love for the search after truth, and you will have essentially what is necessary to conduct graduate work.

Inasmuch as I am making these statements to a body of professional men, permit me to point out what, to me at least, has always appeared to be a fundamental error in the attitude of men of so-called pure science toward those in applied science. Just as Bascom is mistaken in supposing that teachers of the pro-

fessions must lose out in the four "primary qualities" of good undergraduate instruction as you pass step by step from the power to impart information to the power to disclose the essential unity of truth, just so many teachers of graduate students frequently have the erroneous idea that men of pure science only are concerned with the advancement of truth, and that those of applied science are but parasites who utilize the new truths discovered by their colleagues and apply them to practical or even selfish ends.

There never have been, and never will be, any hard and fast lines between pure and applied science. The investigator of truth for its own sake knows well that from every grain of truth there will ultimately develop a veritable harvest of practical application. While he may be satisfied frequently, because he is aware of his limitations, with the mere discovery and statement of a new truth, he is constantly stimulated by this knowledge. The fact that the applied scientist, also because conscious of his limitations, is so often content with the mere application of knowledge discovered by others, is no reason why this practice should be laid down as a dogma that differentiates arbitrarily between the two types of investigators. As a matter of fact modern research, in both the pure and applied camps, is giving the lie more and more to such erroneous fundamental conceptions. If arrogance has erred so frequently in one camp, false pride has erred equally in the other.

So much for the men and the spirit that should govern them. Permit me to emphasize once more that the graduate faculty does not consist of professors alone, but of professors and students. The stimulus of the young searcher after truth is often regarded as being as essential to the teacher, as the guidance of the latter is to the former.

Finally, just a brief word as to equipment. The fallacy of the trite saying of the late President Garfield, a graduate of Williams and an admirer of its famous president, that an ideal college consisted of a Dr. Hopkins at one end of a log and of a student at the other, has been pointed out by another graduate of Williams who was unquestionably more competent to judge and who regarded such catchy snatches of rhetoric as adulation. The time when a Berzelius could be a mighty guide in research to one or two students at a time in his laboratory kitchen, the use of which he had to contend constantly with his cook, is largely a thing of the past; as is also the time when a Scheele could make discoveries in his little apothecary shop laboratory at Koeping, discoveries that surprised the world then and surprise it even more to-day as we appreciate fully the significance of the results accomplished by this worker of miracles; or even the time of the more pretentious facilities of a Sertuerner who discovered the basic properties of morphine, a discovery of which we celebrate the hundredth anniversary this year.

Modern research requires money, more money, and yet more money to provide the necessary facilities. If we but consider the millions spent for agricultural research in this country, if we think of the vast sums with which medical research at the twenty-six research institutes of this country is endowed, if we reflect that a modern "*Farbenfabrik*" will allow not one but many Ph.D.'s to work year in and year out for the discovery of a new remedy, pharmacists might well lose heart and give up the idea of ever accomplishing anything worth while. Though it be true that we may scarcely hope to see another Scheele arise in modern pharmacy,

or even another Sertuerner; yet, with the right spirit, pharmacists in this country need not lose all hope.

Having already related the experience of my matriculation at the University of Bonn, allow me in closing to refer to another experience of the last day spent in Goettingen. The statue of Friederich Woehler was being unveiled before one of the academic buildings; and the four faculties, students as well as professors, were assembled to do honor to the memory of the discoverer of the truth that the substances of animal and vegetable organisms can be produced without the intervention of the life process. It was the venerable Hofmann, the author of so many excellent biographies, who delivered the address. Thinking of the campus with its essentially undergraduate atmosphere, of the laboratory with meager equipment even for undergraduate work that was awaiting him, the American student, who had received so much stimulus from his teachers at two German universities, received the greatest stimulus on that last day when the venerable Berlin professor, in pointing to the difference that existed in the equipment of the new organic laboratory in which the American had been privileged to work for two semesters, and the meager facilities that had surrounded Woehler when he made his remarkable discoveries, said: "*Es kommt nicht auf den Kaefig an. Die Frage ist ob der Vogel der drinnen sitzt singen kann.*" It matters little whether the cage is of wood or gold, the important question is whether the bird in the cage can sing.

THE SCHOOL OF PHARMACY AND THE PROFESSION.*

BY C. FERDINAND NELSON.

It needs scarcely be emphasized that we are living in an age of extreme specialization. A thousand happenings, large and small, significant and trivial, force the conclusion home to us daily. On every side of us, in every walk and avenue of life, wheresoever we chance to turn this minute dissection of things is constantly evident. The division of the world's labor has become tremendously complex. Where but a few years ago one vocation existed ten may exist to-day. The practice of medicine is no longer a single profession, it is rather a dozen separate callings. The engineer is no longer master of his field, but picks out one small corner of it and here does his bit. One lawyer masters criminal statutes, another the law of corporations, a third constitutional or international law. This dentist pulls teeth, another fills them. Specialization rules the day and us. We are its servants whether we will or no, and wherever it leads us we must follow.

The advances in every line of endeavor that have come as a direct result of this concentration have been many and important. It will, however, not serve our purpose to discuss these here except to mention the tremendous impetus that has been given to organized training, to the importance of college and university work in the last decade. The business man, the professional man, the artisan, have all found out that they must be trained rapidly and systematically if they would compete successfully.

* Presented before the joint session of the Section on Education and Legislation, A. Ph. A., the American Conference of Pharmaceutical Faculties, and the National Association of Boards of Pharmacy, Indianapolis meeting, 1917.