

they will be used with judgment and modified when necessary to suit varying conditions.

It may be objected that very few men at present connected with drug work, have had the training which has been advocated, yet many succeeded, but it must be recognized that their success would have been earlier and ultimately greater if they had started with the thorough training which has been suggested. We have worked as well as we could with the material at hand, but if thoroughly trained pharmaceutical chemists had been available during the past eight or ten years, this branch of chemistry would be much further advanced and would be recognized by chemists in other lines of work; nor would it be possible for a well-informed chemical engineer to say to the writer, as was done a short time since, "Pharmaceutical work at present is entirely empirical, is it not?"

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PHARMACEUTICAL EDUCATION, OR THE EDUCATION OF THE PHARMACIST; WHICH SHALL IT BE?

JACOB DINER.

The question of education is justly occupying the minds of many men, educators and laity, and not the least interested in this question are those men who are chiefly concerned with professional education. The medical press for the last ten years has devoted a great deal of time and considerable space to the subject of medical education and the pioneer of American medical journals, the *Journal of the A. M. A.*, regularly brings a column or more on medical education and legislation.

In one of his usual masterly addresses, Henry P. Hynson some time ago sounded the key-note when he spoke of the pharmacist and his need of general education.

Therefore, in taking up the subject of Education as related to Pharmacy and the Pharmacist, we must closely differentiate between the education of the pharmacist and pharmaceutical education.

Modern pharmacy (or, should I say the modern pharmacist?) consists essentially of two integral parts. On one side we must have the professionally or rather specifically-trained man, on the other side we must prepare the same man to be commercially able to avail himself of every honest and legitimate means for the financial advancement of his business. How far shall we educate the embryo pharmacist for one and prepare him for the other,—does modern pharmacy really demand a professionally-trained pharmacist? Is the commercial training compatible with scientific education? To all of which I reply:—Most emphatically yes. The times have passed when the first essential to scientific attainments was utter lack of practical knowledge and disregard of the so-called worldly petty details such as dress, manners, sociability, etc.

The bespectacled professor who forgot his umbrella, his clothes, his meals, his wife, his family, his friends, etc., in short everything that was not ultra scientific still brings forth a sympathetic smile when we see him depicted in our so-called "funny" papers, but modern life and modern scientific progress has no place for him. Just so is the grouchy, misanthropic, sloppy, *yes, sloppy*, old, not to say antiquated, pharmacist in the dimly lit and indifferently-kept apothecary shop, out of place. Thus we must take our young men and teach them pharmacy consisting of the regular, more or less classic, curriculum and at the same time inculcate them with modern business methods so that they may advantageously market their professional attainments.

The New Syllabus of Pharmaceutical Education recently issued by the Committee and adopted by the New York State Board of Pharmacy assigns a number of hours for the subject of commercial pharmacy. No better step for the advancement of pharmacy and pharmacist could have been taken. The pity of it is that these hours are taken from the important subject of pharmacy (practical and manufacturing). Far better had they been taken from the relatively less important subject of Pharmacognosy. I do not want to be understood as holding the subject of Pharmacognosy as superfluous or non-essential. But we must admit that, outside of the specialist in this branch, it is of considerable less importance to the practical and practising pharmacist than are the subjects of Manufacturing, Prescription-Compounding and Merchandising, so long as the regulation Pharmacy course can only take up 1200 hours in two calendar years with a preliminary education of one year high-school or "its equivalent." Would I then want an increased curriculum with higher preliminary education? Yes, and no! For purely pharmaceutical training to meet the demands of the every-day variety of Pharmacy I would most emphatically oppose any attempt at increasing the requirements, either preliminary or professional. I would modify, I would alter, but I would not increase. I would change the foolish attempt to make an organic chemist, a trained pharmacognocist, a physiologist and a Latin scholar, out of a young man who has obtained 15 regents points by an examination in Russian, Italian, Spanish, or whatever his native tongue may be, and who does not know how to handle the simplest mathematical problem. For pharmaceutical education the New Syllabus is more than sufficient.

For the man who wants to specialize, who desires to go beyond the prescription and sales-counter increased training is demanded, and this is provided for in the Syllabus by higher preliminary requirements, more specific training and corresponding higher degrees.

When we come to the education of the pharmacist, that is a different matter altogether.

Let us for once refuse to imitate the ostrich. Let us look the situation in the face, calmly and honestly. Of what material is the great bulk of pharmacists composed? Are they really professional men, and if so, are they really educated men? For after all the collection of a certain amount of special knowledge does not constitute education. How many pharmacists are even approximately posted on the most important topics of the day, even including the European war and baseball? How many pharmacists get out of their four walls to see the world

and be seen by it? How many are interested in scientific and mechanical progress or even the progress made in our own branch? Out of 40,000 pharmacists or over, how many are members of the A. Ph. A., of the N. A. R. D., of their own State Pharmaceutical Association? At a paper read recently at the New York State Pharmaceutical Association the figures given for attendance at State Pharmaceutical Associations throughout the entire United States, showed, if my memory serves me right, an attendance of less than 10%. What Pharmacy needs for its rank and file is not increased Pharmaceutical Education, but increased Education of the Pharmacist!

THE COMPOSITION OF BLOOD.

When Mephistopheles insists that the bond he makes with Faust be signed with blood, and remarks, "Blut ist ein ganz besondrer Saft" (Blood is an extremely peculiar juice), even Goethe, great scientist as he was, had no conception of how wonderful a fluid it is. Human blood consists of a transparent yellowish liquid called the plasma, in which float red corpuscles and at least five kinds of white corpuscles, usually called leucocytes. When the health is normal, each cubic millimeter of the blood contains about 5 million red corpuscles and 7500 leucocytes. The enormous numbers of these corpuscles, red and white, may be faintly realized when it is stated that a cubic inch is equal to nearly 16 thousand cubic millimeters. These cells are greatly changed both in number and condition by ill health. Some of the white corpuscles are called phagocytes (cells that eat) because when the blood is invaded by disease-causing (pathogenic) parasites, it is the business of the phagocytes to run them down and make a meal of them. So wonderful is the behavior of the phagocytes that one eminent scientist recently said of them, "The mononuclear and polynuclear leucocytes have qualities which it is very difficult to call anything else but consciousness." That is to say, each cell is endowed with a mind that directs its marvelous activities. But more wonderful than the corpuscles that it contains is the plasma itself. It can be so changed or modified by zymotic diseases or by certain serums or vaccines that the patient will be immune for years or even for life against a second attack from the same disease, but he will be safe from no other disease of the infectious kind unless he has been vaccinated for it with the proper serum. Blood is indeed an "extremely peculiar juice." How peculiar, who shall say?—*Ambition.*