THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

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A BASIS FOR AGREEMENT ON A STANDARD THREE-YEAR CURRICULUM.*

BY WILLIAM J. HUSA.

One of the outstanding unsolved questions of the day in the field of pharmacy is the question of what constitutes a standard three-year course in pharmacy. In spite of the efforts of college faculties, state boards of pharmacy and the various associations, there is still a great uncertainty as to what subjects and how much of each should be included in the three-year course. A satisfactory answer to the question would be of great value to college faculties in arranging their curricula, and would give the boards of pharmacy a measuring stick by which they could evaluate the course of study and determine whether the curriculum of a given college is up to standard.

In the problem of securing agreement between the colleges and boards on a standard three-year course, it is evident that differences in individual opinion preclude the possibility of securing complete agreement on what subjects and how much of each should be included. On the other hand, the present requirements of the A. A. C. P. allow too much latitude, since they merely provide "that the college shall require of each candidate for graduation not less than 2250 hours of instruction, of which at least 1000 hours shall consist of lectures and recitations, such work to be given in a period of not less than three full college years of at least thirty weeks each . . . ." Likewise the "Pharmaceutical Syllabus," valuable as it is, in its present form is not suitable for adoption as a standard because it contains a statement "that any school is at liberty to modify it by substituting other subjects for those included in the outline" and no limit is set on the amount of substitution that may be made.

The above rough standards were satisfactory as a beginning, but the time has arrived when more explicit and more definite standards are desirable. I would suggest that the desired results may be achieved by definitely specifying 80% or 1800 hours of the course, leaving 20%, or 450 hours to the discretion of the faculty of each individual college. By having 80% of the course uniform as to subjects and hours in all the colleges, the necessary degree of uniformity would be obtained, thus assuring fundamental soundness of the course. The 20% leeway would allow for differences in the purposes, ideals and local conditions of the individual colleges. It would also allow for differences in length of the school year, which commonly varies from 30 to 36 weeks.

The 20% leeway of courses not specified gives each college an opportunity to increase the time allotted to the various courses and to add a limited number of courses not mentioned. Further latitude is available from the fact that it is

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quite practical in most cases to give more than the minimum of 2250 hours in a three-year course. However, there is danger that too much matter may be crowded into the curriculum. Thus some colleges give more than 3000 hours of instruction in three years. This, I believe, is a mistake. The student is thus forced to attempt too much, with resulting drop in quality of work done. For this reason I suggest an upper limit, say 2800 hours, above which no college will be allowed to go without losing its standing. There is a limit to the amount of studying a young person can do, and it is folly to pile on hours upon hours until the capacity of the average student is far exceeded.

To be of value, a standard curriculum must meet with the approval of the boards, colleges and pharmacists in general. These diverse groups could hardly be expected to agree completely on what subjects and how much of each should be included in the three-year course. However, complete agreement on 80% of the minimum course is a goal which is not impossible, in fact, I believe it is one we can reasonably hope to attain.

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NEED OF FINANCIAL SUPPORT FOR COMMERCIAL EDUCATION IN PHARMACY.*

BY C. B. JORDAN.

In the development of education certain professions were given preference. Ministry, Law and Medicine were early looked upon as learned professions and a liberal education as represented by Arts and Science was also classed as worthy of the attention of promising students. All other courses were considered non-professional or utilitarian and therefore unworthy of the élite. It has required many years to break down our old prejudices and to open the professional or ethical doors to other lines of education. Gradually we have come to look upon Dentistry, Engineering, Pharmacy, Home Economics, Agriculture, Journalism, etc., as professional. The latest endeavor to knock at the professional door is Commercial education.

Commerce is as old as the human race because man began to exchange, barter, buy and sell as soon as he had an excess of one product and a deficiency of another. It seems strange that a trade as old as Commerce, the oldest of all trades, should be so slow in seeking recognition as an ethical endeavor. I believe that this can be explained by the fact that, until comparatively recently, no scientific study of commerce was made. Each man who engaged in it learned his lessons in the hard school of experience and his success or failure depended in a great measure upon whether dame luck cared to smile upon him or not.

I am glad to say that that day is past and that we are giving careful, earnest thought and study to determine the best business methods. We are also spending great sums in a scientific study of business to the end that many of the pitfalls may be avoided and that we may have fewer failures.

* Section on Commercial Interests, A. PH. A., St. Louis meeting, 1927.

"Commercial Pharmacy" is only now coming into its own. It is true that some pharmaceutical educators still look upon it as unworthy of their earnest thought because it, in their estimation, is non-professional or unethical. These men will soon have to change their viewpoint or they will find themselves with the hopeless minority.

Since "Commercial Pharmacy" is the last to demand and secure attention from the executives of colleges of pharmacy, it is but natural that it should be limited in its financial support. Our colleges of pharmacy are poorly supported at best and the addition of a new line of work takes from the support of the college and must itself be inadequately financed. It seems to me that we must look for a new source of income if "Commercial Pharmacy" is to be adequately supported.

"Commercial Pharmacy" is only in its infancy and a great deal of research and scientific study must be given to it before we can expect results that are satisfactory. It is true our colleges of pharmacy are endeavoring to teach this subject by a three- or four-hour lecture course for one or two semesters. I am sure that no one will contend that this is adequate for the importance of the subject. Our colleges are doing no more because they are not financially able to do more. It will require considerable sums of money properly to finance a college to do the necessary research and development to place this newest educational endeavor upon a par with other lines of pharmaceutical education.

We are lacking in trained teachers to begin with and these teachers must secure their training, in addition to pharmaceutical training, in expensive Business Colleges, therefore they will demand higher salaries than are being paid to teachers of other subjects. Research and methods of development and also equipment must be paid for if we are to conduct courses worthy of the name of pharmaceutical education. All of this will cost our colleges considerable sums of money and this money must be secured from new sources.

If we are to teach "Commercial Pharmacy" in an efficient manner, we must first know what to teach, especially the fundamentals of good business practice. It is true that a great deal has been written and spoken regarding these fundamentals. However, most of this is based upon opinion secured from experience in business or upon a more or less superficial study of business. Some of our business colleges have conducted researches into restricted lines of business but the business of Pharmacy has not been the subject of any extended study. I am pleased to recognize the splendid efforts that the National Association of Wholesale Druggists is putting into this most important task and I am sure that out of their efforts much benefit will come. However, the colleges of pharmacy should contribute their share and we all recognize that there is plenty of work for all, even if the number of associations, colleges and interested individuals were multiplied by two.

I have a vision, a dream of *service*, that colleges of pharmacy could render to the pharmacists of this country. I recognize that it is only a vision but I believe enough in its possibilities to have the courage to express it at this time.

We are all aware of the great service that the Agricultural Colleges of America are rendering to the farmers to-day. It has required years to perfect this service and to develop an organization in each state that reaches out and touches every

agricultural interest. It is almost impossible for us fully to comprehend the tremendous value this service is to the farmers and to all the people.

Within the past few years our colleges, especially our Land Grant institutions, have extended this service to the industries of the state and we find them holding group meetings with factory superintendents, with tradesmen and with every group in the great industrial world. We find them conducting short courses attended by the representatives of the various industries. They also reach out to the smaller communities in sociological service, in home economics, etc. The splendid response these workers receive attests the great value to the group served. Again it is difficult for us to grasp the great amount of service thus rendered.

Are not these examples of service rendered to the different interests of our communities an inspiration and are they not examples worthy of following? If the Colleges of Pharmacy could command sufficient funds to employ a thoroughly trained teacher to take charge of instruction in commercial pharmacy and also to be available for service to every retail druggist who might wish to seek such service, I believe it would be a very worthy undertaking. When I say a thoroughly trained teacher, I mean one who has had the best collegiate business training plus the best possible practical experience in retail pharmacy. Such a person would be invaluable as a teacher in the college and could also become invaluable to the druggists of the state, at least to those who would care to call upon him for assistance in analyzing their business and in perfecting the most efficient organization compatible with local conditions.

If such a vision is to be realized, it will require considerable sums of money beyond that which our colleges have at their disposal now. Where can we look for a source of revenue that will enable the colleges to render such a service?

Perhaps we can profit by the experience of other commercial colleges. Among the outstanding commercial colleges may be classed the Graduate School of Business of Harvard University and the Babson Institute. I speak of these two, not to give them preference, but because I am partially familiar with their sources of finance. Mr. George Baker of Standard Oil Co. gave the Harvard Graduate School of Business $5,000,000 and added another $1,000,000 on the day it was dedicated. It was also the recipient of another $1,000,000 on dedication day. The Babson Institute was organized by Mr. Babson of statistical fame and we can readily believe that he contributed generously to its finances.

Commercial education in pharmacy is not in need of any such sums as I have just quoted but smaller amounts could very well be used to build up our courses and to extend the usefulness of our colleges. It is to be hoped that a source of financial support, perhaps some Baker or Babson, may be forthcoming.

MOSQUITOES.

BY THE UNITED STATES PUBLIC HEALTH SERVICE.

It is important that every pharmacist shoud know something of the rôle played by insects in the spread of disease. In the last article the fly as a carrier of disease was discussed and explained. The purpose of the present article is to tell something about another insect which is a menace to health, namely the mos-

quito, particularly that mosquito belonging to the genus *Anopheles*, commonly known as the malarial mosquito.

Mosquitoes differ greatly in their habits. Some species of mosquitoes are most commonly found near the home of man. These species are almost exclusively found close to human habitations. This is particularly true of the species commonly known as the yellow fever and dengue mosquito. Another species which may be called the wild mosquito frequents the common salt marshes such as those which are found on the Atlantic coast and seldom frequents the habitations of man. A third class, sometimes called the semi-domestic class, may be found both about human habitations and in swamps and fields. It is to this semi-domestic class of mosquitoes that the genus *Anopheles* belongs. The genus *Anopheles* is the mosquito commonly associated with the spread of malaria and known as the malarial mosquito.

In order to understand the ways and means by which mosquitoes may be eradicated and malaria prevented it is necessary to know something about the life history and habits of mosquitoes. Mosquitoes pass through four stages, the first stage, the egg or embryo; the second stage, the larva; the third, or pupa stage, and fourth the imago or adult-winged insect. The three earlier stages in the life of a mosquito are aquatic, that is, these stages are passed in water. A great many people still think that mosquitoes breed in wet grass, weeds or brushes, because they have seen the winged insects frequently resting in such places. Mosquitoes do not breed in vegetation or on the wet grass or bushes.

Mosquitoes differ not only in their habits but also in the character of their breeding places. The yellow fever mosquito and others of the first species mentioned, sometimes known as domestic mosquitoes, may be found breeding in almost any collection of water near human habitation. They have been found in old tin cans containing water, in broken bottles, in tubs and barrels, in cisterns and wells, in flower pots, in eave gutters, in stagnant roadside pools, ditches and puddles, sewers and cesspools.

The species of mosquito to which the malaria-bearing insects belong may be found breeding in partly filled water barrels, in the hoofprints of animals, in old tin cans, in hollow tree stumps and in postholes. They usually seem to prefer, however, grass-bordered pools, ditches through which water flows but slowly, the margins of lakes and streams, especially if these marginal reaches are shallow and are more or less choked with water plants and reeds which afford protection to the mosquito from small fish.

Some species of *Anopheles* breed frequently on the edges of fairly free running brooks. The wild mosquito selects a breeding place of much the same character. They are frequently found associated with the malarial bearing species, except that these breeding places are more or less remote from the homes of man, in swamps, coastal marches both fresh and salt, and in forests.

Male mosquitoes are vegetarians. The females of many species of mosquitoes have developed a taste for blood and blood has become indispensable to nearly all female mosquitoes for the development of their eggs. The female mosquito usually lays her eggs upon the surface of the water. The eggs of some species float separately on their sides. This is true of the eggs of the *Anopheles*. The eggs of other species adhere and float in the form of an irregular mass, like a small

raft. In a day or two, under ordinary conditions, the eggs hatch out into larvae, commonly known as wiggle tails. The larva is in reality an aquatic animal, but it is a true air breather. The larva of the malarial mosquito ordinarily rests and feeds at the surface of the water, it usually lies in an almost horizontal position, its tail touching the filmy surface of the water. While in this position the larva breathes through a very short breathing siphon.

The larvae of other species of mosquitoes move about more or less in search of food but at intervals of a minute or two they come to the surface of the water for air. Here, at the surface, they hang head down, attached by conical breathing tubes to the film surface. The mosquito remains in this larval stage for about a week. The length of time, however, that a mosquito remains in the larva stage varies with the species and for each species varies again with the temperature. The larvae is then transformed into a curiously shaped creature known as the pupa.

The pupa remains quietly at the surface of the water except when disturbed. It has no mouth and does not feed. It breathes through a pair of tubes shaped very much like trumpets, which project from the under side of the throat. The pupal stage lasts for two or three days, at the end of which time the adult-winged insect emerges from its pupal case through a rent near the breathing tubes.

As short a time as nine days is often all that is required for the life stages of mosquito development. Nine days from the time the eggs are laid, in many cases, the winged insect appears. The time depends upon the temperature and the abundance of food supply. Warmth favors the rapid development of the mosquito, cold retards the growth. Because of the fact, mosquitoes are much more abundant in the summer, early spring and late fall months in the temperature climates. In the tropics, wild mosquitoes become more abundant during the wet season.

Mosquitoes manage to pass through the rigors of the winter. The way in which this is done probably varies with the different species. The malarial mosquito, the *Anopheles*, hides in sheltered places, cellars, dark crannies and out-of-the-way nooks. Other species survive through the power of the larva or egg to resist cold. The larvae or eggs of some species will hatch even after they have been frozen.

Mosquitoes breed in water, in still water and in the pools and grassy edges of running water. They lay their eggs on the surface of the water. These eggs float and in a few days hatch into larvae or "wiggle tails." These live in the water and in time turn into pupae or "tumblers" which turn into mosquitoes. There are four changes in the development of mosquitoes, just as there are in the development of butterflies. For mosquitoes, all these changes must take place in water and for *Anopheles* will take from 12 to 16 days in summer weather—longer in cool weather. The larva of the malaria mosquito lies at the top of the water and parallel to it. The larvae of other mosquitoes hang from top head downward. If these hanging larvae are touched they will dive. If the *Anopheles* larvae is touched, while it may dive, it will generally scoot backward along the top of the water. They are not a particle alike and once seen, no one will ever mistake one for the other. It is important to recognize the larvae of *Anopheles*—far more important than it is to recognize the mosquitoes themselves because this enables man to find the breeding places of these mosquitoes and destroy them while in the larval stage. *Anopheles* prefer to breed in clean water in small shallow, shady

pools with grassy edges. If grass is growing in these pools, so much the better. A marshy piece of ground with small pools among bullrushes and sedges is an ideal place. The grassy edges and quiet pools formed by obstruction of small streams are also favored places as are cattle tracks. They have no objection to running water unless the current is very swift. They occasionally breed in almost any collection of water unless it is very foul—shallow wells, water barrels and tin cans, especially if these have leaves or grass in them or frog moss. Generally, however, they avoid barrels, cans and other artificial containers.

It takes usually about fourteen days for the egg to produce the mosquito. If a collection of water dries up completely in less than fourteen days it is not apt to breed mosquitoes. All mosquitoes have a bill and two palpi which lie close to the bill, one on each side. Outside the palpi are two antennae which spread apart. The antennae of the male are plume-like, those of the female are not. One can tell the male from the female because the male has plumes on his head. You can tell the *Anopheles*, malaria-bearing mosquito, from the other kinds in the United States which do not convey malaria, by looking carefully at the heads of the mosquitoes. *Anopheles* have straight bills and palpi nearly as long as their bills. The females of the other kinds have short palpi except one kind which has a curved bill. There are other differences. The malaria mosquito is slight and graceful. The wings are generally spotted or dusky.

There is still another important difference. That difference is in the way that they rest on a wall. *Anopheles* rests in a straight line, frequently standing on her head. The others rest "humped up." This is a good way to identify the adult live mosquito and is the one method usually used in practice.

Anopheles rarely bite in the day time in the United States. The day mosquito of the South is the yellow fever mosquito *Anopheles*, is shy and easily driven off and will rarely bite you when you are moving about. She is more apt to bite you when you are asleep. Her bite is less painful than that of other mosquitoes and she does not sing so loudly. On this account when mosquitoes are much complained of they are rarely *Anopheles* and there can be many *Anopheles* about without much complaint.

COMMITTEE REPORTS

AMERICAN PHARMACEUTICAL ASSOCIATION COMMITTEE ON COLORED GLASS CONTAINERS.

The May Conference.

On May 4th a conference was held in New York attended by members of committees of four national organizations; the AMERICAN PHARMACEUTICAL ASSOCIATION, the Glass Container Association, the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers' Association; to consider the problem of the deterioration of chemicals and pharmaceuticals when stored in glass containers. The conference which was presided over by Dr. H. V. Arny lasted all day when the many phases of the problem were discussed from all standpoints. The result of the conference may be summarized as follows:

(*a*). It was the opinion of the conference that research on the subject of the deterioration of chemicals and pharmaceuticals in such containers was worthy of careful research.

(*b*). A motion was passed authorizing the appointment of a committee to sound out the manufacturers of pharmaceuticals and chemicals as to the practicability of