A brief but comprehensive report was presented by Chairman DuMez, of the Committee on Education and Legislation. In his report Dean DuMez called attention to the interesting educational experiment which calls for a modified form of internship for students of Pharmacy in the State of New Jersey. The more important recent legislative enactments and judicial decisions affecting pharmacists were enumerated in this report, and satisfaction was expressed with the status of proposed Federal pure food and drug legislation at that time.

At the close of these reports President Hewing proceeded with a report and valedictory address as retiring president. When called on for nominations, however, the Nominating Committee, through Chairman L. M. Kantner, proposed the following slate of officers for 1937: For *President*, A. N. Hewing; for *Vice-President*, John C. Bauer; for *Secretary-Treasurer*, Robert S. Fuqua.

Despite protests from Mr. Hewing against his reëlection as presiding officer of the Branch for a second term, the above nominees were elected. ROBERT S. FUQUA, *Secretary.*

THERAPEUTIC USES OF SNAKE VENOMS.*

BY DAVID I. MACHT., M.D.

The ancients used snake venoms empirically, and pharmacopœias and dispensatories from mediæval times to the nineteenth century made mention of drugs of reptilian origin. The rational employment of snake venom for therapeutic purposes, however, is a development of modern experimental pharmacology. From the therapeutic standpoint, snake venoms may be divided into three groups: (1) The venoms of the *Crotalidæ*, or rattlesnakes, of which the first group is chiefly comprised, have been employed in treating epilepsy. Considerable medical literature has been published on this subject. The treatment of epilepsy with crotalin, however, has been largely discontinued because of its rapid decomposition and the difficulties encountered in preparation of a sterile solution of this venom. (2) To the second group belong the venoms of the moccasin (*Ancistrodon*) and Russell's viper, which are said to promote coagulation of blood and have been recommended in the treatment of such pathological conditions as purpura, uterine hemorrhage, etc. While moccasin venom has no effect on true hemophilia, some English investigators claim that the venom of Russell's viper is efficacious even in that condition. (3) Much rational scientific experimentation has been done and many clinical data have been obtained concerning the third group of venoms. It is the venom of the cobras that is especially rich in neurotoxins or those constituents which even in small doses affect the nerve cells and other nerve elements. Cobra venom has been found useful in relieving the severe pain induced by advanced and hopelessly malignant tumors, and in such cases has been found, first by French scientists and then by the speaker and his collaborators, to be an effective substitute for narcotics or other analgesics. The dosage of the solution of cobra venom prepared is biologically assayed in mouse units. Dr. Macht has experimented extensively with this drug in his laboratory and as the result of much pharmacological study has developed a method of preparing a safe, sterile solution of cobra venom, suitable for clinical administration. After long and careful laboratory experimentation, the speaker secured the collaboration, in a clinical study of this method of treatment, of several eminent surgeons, particularly of Dr. Curtis F. Burham of the Howard A. Kelly Hospital, and of the late Dr. Joseph Colt Bloodgood.

The results derived from laboratory and clinical investigation of the drug have been very satisfactory. Sixty per cent of a series of two hundred cases experienced definite relief of pain and 35 per cent gave evidence of marked relief after a series of cobra venom injections.

The usual therapeutic dose of the drug for adults is 5 mouse units. This amount is injected intramuscularly for three or four successive days. After relief from pain is achieved, injections are continued at longer intervals, and one or two doses a week may suffice to keep the patient comfortable. In some cases, however, larger doses are required, no unusual procedure even where ordinary narcotics are employed.

The results of the laboratory studies by Dr. Macht on the mechanism of analgesia produced by cobra venom point to the higher centers in the brain as its seat of action. Cobra venom

* Abstract of an address, delivered January 14th, before Baltimore Branch of the A. PH. A.

does not produce local anesthesia either of sensory nerve endings or the nerve trunks but like morphine and opium acts on the cerebral areas concerned with pain. However, morphine and cobra venom exhibit a marked difference in action. While morphine promptly produces an analgesia which lasts a few hours and then wears off, cobra venom does not usually become effective until several injections of the drug have been given on successive days but the analgesia, once induced, is of much longer duration than that effected by morphine. This difference in action between cobra venom and morphine is explained in part at least by biochemical studies made on auto-oxidative processes taking place in fresh brain and muscle tissues with and without cobra venom and morphine, respectively. Both of the drugs are largely localized in the brain tissue. Morphine, however, is rapidly oxidized or otherwise chemically changed after it comes into contact with brain tissue while cobra venom remains unchanged for a much longer period and for that reason exerts a therapeutic effect of much greater duration.

In the clinical cases so far treated with cobra venom, no symptom of narcotic addiction has been noted. On the contrary, cobra venom has been successfully substituted for morphine and other opium narcotics in treatment of patients suffering from addiction. The use of cobra venom as an analgesic is now being extended not only in cases of hopelessly malignant tumors but also in patients suffering with chronic diseases characterized by severe pain, such as tic douleureux and other neuralgias, and chronic arthritis.

The successful therapeutic dosage of cobra venom (much smaller than that advocated by French investigators) is not as small as that of many well-known official drugs. When tested on cats, it is less poisonous, weight for weight, than aconitine and ten times weaker than ouabain. Yet such is the peculiar psychological reaction on the part of the inexperienced—whether laymen, pharmacists or physicians—that the word "cobra" instantly suggests a horrible death-dealing reptile whereas ouabain is considered only with equanimity and regarded as but a useful heart tonic. This is but another illustration of the fundamental pharmacological dictum that every drug is a poison and practically every poison may be used as a medicinal agent. Whether it shall serve in one capacity or the other depends on a complete knowledge of its action and on the various conditions which must always be taken into account before initiating any therapeutic procedure.

CHICAGO.

The monthly meeting of the Chicago Branch, AMERICAN PHARMACEUTICAL ASSOCIATION, was held January 19th, at the University of Illinois College of Pharmacy.

President Morrison opened the meeting and called for the report of the Nominating Committee. Dean Day presented the report and the following were unanimously elected as officers of the Branch for the coming year: *President*, H. M. Emig; *First Vice-President*, Lawrence Templeton; *Second Vice-President*, R. A. G. Linke; *Third Vice-President*, O. U. Sisson; *Secretary-Treasurer*, R. E. Terry; *Delegate to the House of Delegates*, R. E. Terry.

Secretary Templeton read the financial report for the year 1936.

A resolution of condolence was adopted lamenting the death of Wilhelm Bodemann, well-known Chicago druggist, who held a life membership in the ASSOCIATION.

An engraved testimonial of appreciation was presented to Professor Emeritus Clyde M. Snow by the faculty of the University of Illinois College of Pharmacy, expressing the warm friendship that has existed during his thirty-four years of teaching at the College.

President Morrison introduced the speaker of the evening, Dr. H. A. Shonle, of the Eli Lilly Company who discussed "New Synthetic Remedies."

Dr. Shonle pointed out that many of the medicinal chemicals are the same regardless of whether they have been abstracted from plants or prepared synthetically in the laboratory. Attempts are made by the chemists to reproduce natural plant drugs and in many cases the natural drug is used only as a pattern in an attempt to improve the therapeutic qualities of the drug. Many synthetic remedies have also been produced that have no similarities in chemical structure to plant constituents.

He explained that most of the future remedies may be expected to come from the synthetic chemists as most of the plant constituents have already been discovered. Many synthetic chemicals have been known for years before they have been used as medicines. Mandelic Acid was cited as an example.

A discussion, accompanied by lantern slides, was given of the Antimony compounds, Mercurials, Arsenicals, Prontylin (only in the research stage), Mandelic Acid, the Barbituric Acid group, Cocaine and Metycaine, Ergot alkaloids, Cholesterol and the Vitamins.

Certain rules are used by the chemists in developing mercurials. When the mercury is separated from the benzene ring the bactericidal power is increased and the toxicity is decreased. Divalent sulfur inserted into the molecule stimulates tissue healing.

In the barbituric acid group the molecule is split into two groups, the aliphatic group or lipoid soluble and the urea side is looked upon as the solubilizing or water-soluble group.

Attempts have been made to introduce alcohol, ether, ketone and analgesic groups into the molecule, all either destroying or modifying the desired results. The dose goes up with the increase in molecular weight and this is probably due to the lowered solubility of the compounds.

The structure of cocaine was studied and this led up to procaine. Most of the synthetic local anesthetics are based on the same chemical model and if future progress is to be made in this field the organic chemists should find a new model. Metycaine is away from the old model of local anesthetics.

Lately the active constituent of ergot, ergotocin, has been isolated and its empirical formula is known. As soon as the structural formula is known the chemists will attempt to synthesize it.

The importance of cholesterol in medicine was shown by mention of the fact that it is the basis of sex hormones, heart poisons, provitamin D, bile acids, and many other compounds based on the cholesterol pattern.

A detailed discussion was given of the work done by the chemists on the vitamins showing the progress that has been accomplished in the last few years by the chemists in determining the formulas of the vitamins and the synthesis of some.

Dr. Shonle closed his very interesting discussion by declaring that the next field for the chemist to decipher is that of the proteins in an attempt to discover from the chemists' standpoint the structure of the antitoxins, etc.

The meeting was closed by the large group assembled giving Dr. Shonle a standing vote of appreciation and thanks for his very interesting presentation.

LAWRENCE TEMPLETON, *Secretary.*

NEW YORK.

The January meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held January 11, 1937, at the Columbia University, College of Pharmacy, 115 West 68th Street, N. Y. C.

President F. Schaefer presided and about fifty members and guests were present.

The minutes of the December meeting were read and approved.

The Treasurer, Mr. Currens, reported a balance, January 11th, of $286.03.

Chairman Hauck, of the Committee on Membership, reported that he was endeavoring to enroll those members of the Branch who are not members of the A. PH. A., in the latter organization.

Dr. Kidder drew attention to the date February 9, 1937, stating that there would be a celebration of the twenty-fifth anniversary of the Fordham University, College of Pharmacy. Dr. Wimmer stated that the celebration was in charge of Joseph Hammer and he hoped that a large delegation from the Branch would take part.

Chairman Lehman, of the Committee on Education and Legislation, reported as follows:

"The U. S. Supreme court having declared the Fair Trade Laws of Illinois and California, valid, especially in the matter of the second clause, which binds non-signatories, efforts are being made in this state to obtain a reversal of opinion on the part of the Court of Appeals, which based its adverse opinion on the clause number two in question. The New York State Pharmaceutical Association has filed a brief, 'Amicus Curiæ' written by its attorney, Joseph J. Hammer, in the case of Bourjois Sales Corporation *vs.* Abraham Dorfmen, which is to be tried in the Appellate Division in the next few days. In case the court refuses to reverse itself, new legislation, reënacting the law may be necessary.

"In order to strengthen the Robinson-Patman Law, it is proposed that all states adopt a model law after the federal act. It is stated that various trades are sending similar proposed laws

to their constituents, for enactment, and it is hoped that New York State will have its bill in, at an early session of the legislature. The N. A. R. D. is sending copies of the proposed law to the various state organizations and local branches.

"The New York Pharmaceutical Council is favoring an ordinance which, if enacted, will place a tax fee or license fee on any itinerant vendor of ice cream to the extent of $100.00 for each vehicle so selling ice cream on the streets of this city. In case of two or more salesmen to the vehicle, there is an additional fee of $10.00 for each additional individual so employed. Violations are to be penalized by a fine not to exceed $200.00, and if unpaid, the violator shall be confined to the county jail for a term of not more than 30 days.

"The Health Commissioner of the City of New York, desires a list of all pharmacies which are open all night, or those that give night service by responding to night bells. Please notify the New York Pharmaceutical Council if you come in that category. Commissioner Rice claims that much inconvenience has been caused to persons desiring to have prescriptions filled at night.

"The City Department of Finance has at last admitted that Cod Liver Oil is a food, not a medicine. This refers, however, only to the unmixed oil, not emulsions, nor Vitamin combinations.

"The New York State Legislature and the Congress of the United States are now in session, and we may expect to reap a big crop of bills of interest to the pharmaceutical profession. So far only rumors have reached your Chairman but by next meeting he hopes for much news to report."

A motion by Mr. Mason (seconded by Mr. Lehman) that a Program Committee to consist of one member from each borough, one member from each College of Pharmacy and the secretary, be appointed, was carried. President Schaefer appointed Mr. Mason as Chairman. Others are to be appointed later.

The chair was then turned over to Dr. Canis who proceeded to the election of officers.

The Nominating Committee reported its decision to renominate all present officers. These are: *President*, Frederick C. A. Schaefer; *Vice-President*, Otto F. A. Canis; *Secretary*, Horace T. F. Givens; *Treasurer*, Turner F. Currens; *Committee Chairmen:* Education and Legislation, Robert S. Lehman; Progress of Pharmacy, Leonard W. Steiger; Professional Relations, James H. Kidder; Membership, Rudolf O. Hauck; *Secretary, Remington Committee* and *Delegate to the House of Delegates*, Hugo H. Schaefer.

A motion by Mr. Mason (seconded by Dr. Wimmer) that the report be accepted and one ballot cast was carried and the officers were declared elected.

President Schaefer resumed the chair and called for the report of Mr. Steiger on the Progress of Pharmacy. His report is as follows:

"U. S. Patent No. 2,064,840 was granted 12/22/36 to J. Leon Lascoff, for a capsule-filling machine.

"U. S. Patent No. 2,065,196 to Ivan Parfentjen of Pearl River (Lederle Laboratories) for a method of Purification of Antitoxin and the like. A proteolytic enzyme is added to antitoxic serums under such conditions as to digest the greater part of the serum proteins without substantial loss of antitoxin. The digestion is carried out under acid conditions, not greater than p_{H4}. This is the first important improvement since the invention of the ammonium sulphate method.

"U. S. Patent No. 2,066,302 to John Reichel, assignor to Sharp & Dohme for lyophilic biologically active substances. As new products, lyophilic sera, etc., in a solid state, obtained by the rapid freezing at about $-70°$ C. and removal of frozen water from the frozen material at high vacuum. The material is capable, when water is added thereto, of forming a liquid product similar to the original substance in its biological and therapeutical properties.

"U. S. Patent No. 2,066,742 to Hans Schmidt, assignor to Winthrop. A neutral complex compound of trivalent antimony with neutral alkali metal saccharate. Claimed to be a valuable medical agent.

"*Drug Topics* quotes Dr. Russell M. Wilder on the 'Use of Protamine Insulin at the Mayo Clinic.' The new insulin is said to have several advantages, the principal one being that it is absorbed quite slowly into the blood and consequently has a longer action and makes necessary fewer injections.

"Dr. C. H. Best, who discovered Insulin, read a paper on 'Protamine Insulin' at the recent convention of the Canadian Medical Association. Protamine insulin, according to Dr. Best, is obtained in Canada from Salmon Sperm, principally from the Fisheries Biological Station at Nanaimo, British Columbia. The linking of protamine with insulin was the outcome of the work of Dr. Gustav Haggerdorn of Copenhagen, Denmark."

President Schaefer then introduced the guest speaker, Dr. C. R. Addinall, Director, Library Service Bureau, Merck & Co.

Dr. Addinall spoke on the subject of "Choline and Its Derivatives."

At the conclusion of his talk, Dr. Addinall was accorded a rising vote of thanks, and the meeting adjourned.

HORACE T. F. GIVENS, *Secretary.*

CHOLINE AND ITS DERIVATIVES.*

The recent announcement of the award of the Nobel Prize for medicine and physiology for, 1936 to Sir Henry Dale and Professor Otto Loewi compels our interest in the achievements of these two eminent biochemists and makes a review of the recent developments in the pharmacological field of choline derivatives of timely importance.

It is commonly understood that the coördination of the activities of the body is carried out, to large extent, by the transmission of physical impulses along the nerves and by the transportation in the blood of chemical substances now known as hormones from the endocrine glands to the seat of action. In addition it has been known for some years that the sympathetic and parasympathetic nerves of the autonomic system controlling the involuntary activities of the viscera, the heart and the blood vessels, do not exercise this control by nerve impulse but by the liberation of powerful chemical compounds. The first clear demonstration of this chemical transmission of nervous effects was given in 1921 by Otto Loewi who discovered that, upon stimulation of the vagus nerve in a frog, a substance was liberated in the heart muscle which exerted a parasympathetic action upon perfused tissues. He recognized the close similarity of this substance with acetylcholine whose intense activity had been recognized by Reid Hunt thirty years ago, long before there was any reason to believe that it occurred in the body or had any important natural function. As a result of a brilliant series of researches it was finally proved by Sir Henry Dale that the actual chemical substance which is released at all parasympathetic nerve endings on stimulation is acetylcholine. Extension of this work by other investigators has shown that this chemical compound is released upon stimulation, not only of post-ganglionic and pre-ganglionic parasympathetic nerves but of preganglionic sympathetic nerves and that, probably, every motor nerve impulse to muscle fiber produces its effect by liberating acetylcholine and thus stimulating the fiber to contraction.

The name "choline" was suggested by Strecker who discovered the base, $HO.N(CH_3)_3.CH_2.CH_2OH$, in the bile of cattle and swine. It is found as a constituent of lecithin in the brain and in egg yolk. It is widely distributed in plant and animal organisms and is probably a constant product of plant life necessary for the building up of all plant cells.

Choline is a non-crystallizable syrupy liquid with a strong alkaline reaction and little physiological activity. Consequently the hydrolysis of its potent ester, acetylcholine, $HO.N(CH_3)_3.CH_2CH_2OCOCH_3$ into choline and acetic acid results in an almost complete loss of physiologic action. In consequence, although acetylcholine is a substance of tremendous physiologic potency its usefulness as a therapeutic agent is greatly limited by its susceptibility to rapid hydrolysis and nearly complete inactivation by a specific cholinestrase existing in the blood stream.

In 1914, Dale carried out an extensive research on the action of certain esters and ethers of choline and their relation to muscarine. This investigation started with the observation that certain specimens of ergot and its extracts exhibited an action of the "muscarine" type and had for its aim the isolation of the muscarine-like substance and the elucidation of the chemical structure of true muscarine. In addition to identifying the principle in question as acetyl-choline, Dale showed that "so-called synthetic muscarine" is identical with the choline ester of nitrous acid which, in common with various choline derivatives and choline itself, possesses most of the actions of true muscarine and an effect of a different type—the so-called "nicotine action." The former

* Paper read before the N. Y. Branch of the A. PH. A., Jan. 11, 1937, by C. R. Addinall, PH.D., Director of Library Research, Merck and Co., Inc.

action may be summarized, with certain qualifications, as a reproduction of the effects of stimulating cranial and sacral autonomic nerves—effects which are all abolished by small doses of atropine and which are unaffected by nicotine. Nicotine action may be summarized as a stimulation followed by paralysis of autonomic ganglia throughout the body. The action is abolished by large doses of nicotine and is unaffected by small doses of atropine. Since the nicotine-like action of the quaternary ammonium bases such as hordenine methiodide has been known since the pioneering work of Crum-Brown and Fraser in 1868 it was not surprising to find choline and its derivatives possessing an action which resembles that of nicotine and, to some extent, curare.

As was pointed out by Dale it is possible to imagine a series of bases, ranging from muscarine to hordenine methiodide, these end members having pure muscarine and pure nicotine action, respectively, and the various choline derivatives ranged in a series as intermediate terms according to the relative intensities of the two types of action. Thus, the derivative acetyl-betamethyl choline, $HO.N(CH_3)_3CH_2CH(CH_3)OCOCH_3$, studied by Reid Hunt and later investigated pharmacologically by Simonart, has a powerful muscarine effect, but little or no nicotine action. It is thus very well suited for clinical use and has since been tested by various investigators and found to be more satisfactory as a vasodilator than acetylcholine. The ethyl ether of beta-methylcholine, $HO.N(CH_3)_3CH_2CH(CH_3)OC_2H_5$, has also powerful muscarine and feebly nicotine action, but is not so well suited for clinical use as acetyl-beta-methylcholine. As noted by Reid Hunt there is some evidence that acetyl-beta-methylcholine is potentiated by eserine, and this potentiation has since been attributed to the inhibition by this alkaloid of the specific esterase present in the blood stream which catalyzes the hydrolysis of the ester.

Acetyl-beta-methylcholine chloride was first prepared and made available in the pure form as the chloride, $Cl.N(CH_3)_3CH_2CH(CH_3)OCOCH_3$, by Major and Cline. It is a fine white crystalline substance which produces effects similar to those obtained by stimulation of the parasympathetic (vagus) nervous system. It contracts the pupil, slows the heart, lowers blood pressure, constricts the bronchioles, stimulates the activity of the sweat glands and of the secretory glands of the gastro-intestinal tract, increases intestinal tone, stimulates peristalsis, contracts the detrusor muscle of the bladder, relaxes the bladder sphincter, and dilates all blood vessels of the peripheral vascular system. On account of its greater stability in body fluids and its freedom from nicotine-like action, it is a much more effective remedy clinically than acetylcholine. It has been used in a wide variety of diseases such as paroxysmal tachycardia, Raynaud's disease, varicose ulcers, etc.; for the relief of pain in rheumatoid arthritis and in other conditions in which parasympathetic stimulation is indicated. Quite recently Myerson has shown that it remarkably stimulates the production of mucin, regularly increases gastric juice secretion and inhibits the production hydrochloric acid and pepsinogen, thus producing a copious alkaline gastric juice.

The actions of carbaminoylcholine were first studied by Kreitmar and later by Nöll and Velten. It is at least as acetyl choline in various kinds of tests. Its action on blood pressure was stated to be much greater than that of acetylcholine, but this was not confirmed by Ghang and Gaddum, who found, in several experiments, that the effect of carbaminoylcholine on the blood pressure was slightly less than that of acetylcholine. In any case carbaminoylcholine is much more stable than acetylcholine, and is effective when given by mouth. Tests applied by Kreitmar, Nöll and Velten were mostly tests for muscarine activity. Feldberg has shown that carbaminoylcholine also has nicotine-activity similar to that of acetylcholine.

The problem of muscarine, initiated by Schmiedeberg and Koppe more than half a century ago, is one of great chemical and pharmacological interest. These workers succeeded in isolating from the fly agaric (*Amanita muscaria*) a deliquescent syrupy base with very powerful physiologic properties, arresting the frog's heart in diastole in very small amounts, an action which is antagonized by atropine. From an analysis of the aurichloride, Harnack in 1876 assigned to muscarine chloride the constitution of a hydrated aldehyde, $Cl.N(CH_3)_3CH_2CH(OH)_2$. Nothnagel's later work corroborated this formula. A complication arose when Berlinerblau and E. Fischer independently synthesized the chloride, the corresponding betaine aldehyde, $Cl.N(CH_3)_3CH_2CHO$, (anhydromuscarine chloride) which was shown by Hans Meyer to have physiologic action quite different from those of natural and "synthetic" muscarines. Attempts at synthesis by Schmidt and Bode (1892), Nothnagel (1893), and Ewins (1914) failed to produce a quaternary base having a muscarine action similar to that of natural muscarine, *i. e.*, devoid of the nicotine-curare type of action.

Accordingly, in 1922, King undertook the isolation of the potent principle of *Amanita muscaria* by making use of its solubility in absolute alcohol and its immunity from precipitation by precipitation by basic lead acetate or colloidal iron. From twenty-five and a half kilos of fresh mushrooms collected in the birch woods in the neighborhood of London in October 1921, he succeeded in isolating 0.4 Gm. of muscarine chloride with an activity greater than any previously reported product, 0.002 mg. stopping the frog heart in diastole. The substance had a molecular weight or equivalent weight of the order of 210 while that of choline chloride is 137, and, consequently, muscarine is not of the same order of simplicity as choline and in that there is no evidence for the accepted formula with one atom more than choline, King came to the conclusion that it must be classed with the alkaloidal bases of great complexity. Its stability to alkali shows that it cannot be a choline ester and it appeared to King that there is no satisfactory evidence that it is a quaternary base.

The problem was taken up anew by Kögl, Duisberg and Erxleben in the laboratories of the Universities of Göttingen and Utrecht. These workers, taking advantage of the properties of Reinecke's acid, recently introduced into organic chemical procedure, were able to isolate 3.5 Gm. (about $^1/_{10}$ oz.) of muscarine from 1250 kilos (approx. 1 ton) of mushrooms collected by school children and forest workers. The pure product had enormous muscarine physiologic activity and, chemically, proved to be a saturated aldehyde which on Hofmann degradation yielded trimethylamine and alpha-beta-dihydroxy valeric acid. This suggests the formula, $HO.N(CH_3)_3CH(CHO)-CH(C_2H_5)OH$, for muscarine. It seems strange that the old workers, with their analyses of impure preparation, should have come so close to the correct conception of muscarine and should have recognized its trimethylammonium structure and aldehyde nature. The overwhelmingly important rôle played by the alpha and beta substituents is emphasized by the confusing fact that if Kögl's formula for muscarine is correct then curare-nicotine like action is not inevitably the physiologic effect of quaternary ammonium bases.

Quite recently Bonnett and Major of the Merck Laboratory have attempted the synthesis of muscarine on the basis of Kögl's formula. Starting from alpha bromovaleraldehyde diethyl acetal they succeeded in obtaining the diethyl acetal of one of the structures postulated by Kögl. This acetal had no muscarine action, and all attempts to hydrolyze the acetal failed.

To their intense therapeutic importance, their manifoldly complex dual physiological nature, the sensitivity of their esters to enzyme action, the profound modification brought about by substituents in the alpha and beta positions and the difficulties inherent in the isolation of the various members from natural sources may be attributed the fascination of chemical and pharmacological work in the field of the choline compounds. The renewed interest of the last few years has already been rewarded by the discovery of specifics which are, undoubtedly, the precursors of still more ideal therapeutic agents.

NORTHERN NEW JERSEY.

The Northern New Jersey Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION met at Rutgers College of Pharmacy, January eighteenth. The guest speaker was Chairman J. Leon Lascoff, of the Committee on the Recipe Book.

Dr. Lascoff spoke on the subject "Ophthalmic Prescriptions and Prescription Incompatibilities." He stressed the advisability of having a section of the prescription department set aside exclusively for this type of prescription. For this department the chemicals should be selected with especial care. The mortars, graduates and other apparatus should be reserved for use in this section only.

The speaker exhibited a number of prescriptions which had been compounded as written, and again compounded in such a manner as to present the medication in a more uniform and more pleasing appearance. The command of the physician, "take thou and make according to the art" is more than ℞ ft. *S. A.* to the pharmacist who has a little above the average knowledge of the art, and a desire to use a little common sense.

The display of the many files of correspondence involved in the revising of the first edition of the Recipe Book illustrated the painstaking care that Dr. Lascoff has exercised in attempting to make the Second Edition of this invaluable book even better than the First Volume.

Prof. A. F. Marquier and R. W. Rodman reviewed the progress of state and national legislation regarding bills concerning the pharmacist.

CYRUS L. COX, *Secretary.*

PITTSBURGH.

Those who were able to attend the January meeting of the Pittsburgh Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION enjoyed to the full the scholarly presentation of Dr. James D. Heard, on the subject "Ancient Drugs in Ancient Bottles."

He sketched centuries of Ancient Medicine and Pharmacy, and devoted particular attention to the history and discussion of some of the ancient medicines, their development and decline, not forgetting to stress those, though sometimes worthless, that are still found in American Drug Stores, or in the market places of the European and Oriental World.

Doctor Heard stressed the part which fancy played in the development of remedial agents, how the "Doctrine of Signatures," held in such high esteem, because of the thought that each plant advertised with it, in its form and shape, its goodly virtue from the organ of man it resembled.

He considered the origin of the Theriacs, so prominent as antidotal agents in an age when the taking of a human life was common practice. How the formula became more and more complex as each succeeding Physician or Pharmacist added thereto another favorite drug. He referred to the sacred sealed earths of Lemnos and Malta, their sophistication, and their supposed value. So highly were their virtues told, that even Galen, succumbed to its lure and used it in his practice.

The weapon ointment, that cured the wound by applying the healing potion to the weapon or "a reasonable facsimile" that caused the injury. The bezoar stone with its reputed value, and the horn of the fabled unicorn, were interestingly presented.

The hicra picras of 500 years ago: the sympathetic powder—the moss from a dead man's skull—the mandragora, that many an author describes so realistically, and we marvel at the credulity of benighted gatherers who believed the root emitted an almost human shriek as it is pulled from the ground.

He pointed out facts concerning Digitalis, especially Withering's noted contribution. Doctor Heard has among his collection a first edition of Withering's "Writings on Digitalis."

These together with numerous slides to illustrate ancient drugs and containers, and inspired pictures, served to interest and entertain all who attended.

FRANK S. MCGINNIS, *Secretary.*

CITY OF WASHINGTON.

The monthly meeting of the City of Washington Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held February 8th, in the Assembly Room of the AMERICAN INSTITUTE OF PHARMACY. President W. Paul Briggs presided. The minutes of the January meeting were read and approved. Treasurer McCloskey acknowledged receipt of the Branch's funds from former Treasurer H. C. Fuller.

President Briggs introduced Secretary E. F. Kelly, of the AMERICAN PHARMACEUTICAL ASSOCIATION, who spoke on "Local Branches." He outlined the history and functions of Local Branches and stated that the Branches should not interfere or conflict with work undertaken by State Associations.

"This Branch," stated Dr. Kelly, "can be of great assistance to the State Associations, other Local Branches and all other pharmaceutical associations. Washington being the capital and the home of the different departments and bureaus of the Federal Government, invaluable information relating to pharmacy can be brought together and the news promulgated to the pharmacists of the United States."

"Pharmacy being a public health profession should be interested in all public health problems and its members should coöperate with other public health agencies in matters affecting the health of the public. The pharmacists should make the facts known and should make the public conscious of the work done by this profession."

Secretary Kelly's interesting address was well received.

President Briggs introduced the next speaker of the evening, Paul T. Rees, Chief Pharmacist, United States Naval Medical School, who offered a paper on the "Study of Emulsions." He gave the history, theory, use and manufacturing of extemporaneous emulsions. He presented his paper in a most interesting manner with the aid of exhibits and micro-photographs.

In discussing four methods of manufacturing emulsion of Cod Liver Oil and testing these clinically, Mr. Rees gave the following results: Type "A" emulsion, made by a very inexpensive

Homogenizer, administered to adult male, a Doctor of Medicine: Palatability, excellent; regurgitation, none; miscibility, all traces of emulsion removed from the mouth by drinking water.

Type "B" and "D" emulsions made by hand and Mix Master: Palatability, taste of oil; regurgitation, four to six hours after administration; miscibility, water failed to remove all traces of emulsion from mouth.

Type "A" emulsion, administered to a child, twelve years of age and to a child nine years of age, same result as Type "A."

Types "B" and "D," administered to children: Palatability, taste of oil, claimed nausea, and refused further administration.

In his summary, Mr. Rees stated, "In comparing the time of manufacture and stability of the finished product, the 'Homogenizer' produced the best emulsion and required only eight minutes to manufacture. The 'Mix Master' required but eight minutes to manufacture, producing a satisfactory product for immediate use, but showed stratification in one week. The hand-made emulsion required sixteen minutes for manufacture and produced a product satisfactory for immediate use but showed stratification after one week. The milk shake mixer proved unsatisfactory, since no emulsion was formed after sixteen minutes of stirring."

"Conclusion—The practice of using the ever-handy milk shake mixer for manufacture of extemporaneous emulsions is emphatically condemned. For the manufacture of a satisfactory emulsion the following methods are recommended in the following order, based on their stability: Homogenizer, Mix Master, and Hand Made."

The paper was well received. Mr. Lee moved that the paper be accepted; motion was seconded and passed.

Secretary Kelly suggested that Mr. Rees give his paper at the annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION.

After thanking the speakers for their splendid presentations, President Briggs gave a tentative program for the March meeting.

V. B. NORELLI, *Secretary*.

After the regular meeting, President Briggs called a meeting of the executive committee for the purpose of considering an amendment to the By-Laws in reference to the date of the meetings.

It was moved by Mr. Howes and duly seconded, that the members of the Local Branch vote on the following proposed amendment to the By-Laws:

"The meetings are to be held on the *third* Monday in each month, and all pharmacists and others interested in the development of Pharmacy are invited to attend."—Passed.

The Washington, D. C. Branch of the A. PH. A. will meet at the AMERICAN INSTITUTE OF PHARMACY, Monday, March 15th, at 8:00 P.M. The contributors to the program are: L. E. Warren, S. L. Hilton, John W. Lee and Frank A. Delgado.

Their subjects are, in the order of the names given:

1. "The Association of Official Agricultural Chemists and Their Work on Drug Research."
2. "Some Features of the Pharmaceutical Recipe Book II Exhibit."
3. "Methods of Capsule Filling, Comparison of Accuracy, Speed and Other Factors."
4. "Significant Facts Concerning Pharmacy Contained in the New U. S. Census Distribution."

Miss Esther H. Barney, who was in charge of the pharmacy exhibit at the Century of Progress Exposition through both summers of its operation and in charge of the pharmacy exhibit at the Texas Centennial, was in Washington to confer with the Public Health Service relative to the exhibit in Dallas. She also visited museums and exhibits in Washington for gaining further information on the subject. Her work has been eminently successful in making pharmacy better understood by visitors. While on her visit, she extended this to nearby Virginia where her grandfather, well up in the 90's, resides.

It is expected that the exposition in Dallas will be Pan-American and that the Mexican Government will have an exhibit in the Hall of the Latin Americas now under construction for the exposition.