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ON THE WORK OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION¹

AMONG the many reforms which have sprung up in the last few years and have grown in a modest way one may be mentioned which, while of great practical value to the public, has appealed first and directly to medical men only, and has therefore been generally overlooked by the people at large. To understand the genesis of this reform a few words of history will be necessary.

We do not have to go back very far to recall a time when a marvelous faith was placed in the power of drugs to cure or alleviate all manner of ills. Many of these drugs were of the crudest description, and were often extracts or tinctures of various barks, roots or leaves of somewhat uncertain composition, used alone or in combination with certain inorganic, and a few organic salts. The use of these things was an inheritance and also a development from older usages, going back to the *materia medica* of the disciples of Galen, on the one hand, or to the mineral chemistry of the followers of Paracelsus, on the other. In spite of the advance of knowledge the pharmacopœias of the nineteenth century contained a great deal of rubbish, the weeding out of which has been a difficult task.

In consequence, however, of the rapid advance of knowledge a gradual distrust of the value of the great majority of drugs, and indeed of drugs in general, began to appear among medical men. The situation was described as one of therapeutic nihil-

¹ A paper read before the Evanston Scientific Association, November 4, 1910.

ism, and, like all nihilism, was an unjustifiable extreme. It is, of course, true that a great number of the remedies used by physicians of fifty years ago were either inert or incapable of producing the results claimed for them, but the gradual recognition of this fact should not have occasioned a blindness as to the actual value of others which are still employed, and with demonstrable worth.

Another fact which contributed not a little to the growing distrust among physicians of the efficacy of drugs was the very marked development of the patent medicine business, and its peculiar exploitation through the daily press. Many of the so-called patent medicines were simply prescriptions which had enjoyed some local popularity for particular ailments. Turning them into cure-alls, while serving to catch the public, would naturally condemn them among the great body of physicians, and with them many other remedies used for the same purposes. The condemnation of patent or proprietary remedies by physicians was naturally ascribed to jealousy, and the fear of losing business. The doctors' attitude was classed as a trade interest and the newspapers which profited by advertising patronage took care not to dispel this notion, which was often a false one.

This ugly situation soon became worse by the entrance of another factor. While the greatest triumphs of organic synthetic chemistry were first in the color industries, it was in time shown that many of the coal tar derivatives possessed marked physiological properties which might give them value in medicine. The developments in this direction were enormously rapid. Recall what has been done in twenty-five years! In the efforts to produce artificial alkaloids with the properties of quinine a number of aromatic synthetics were de-

veloped. The first of these was known as kairin, a quinoline derivative, with some good properties, but having certain secondary actions rendering it risky in use. A host of others followed, and great factories were soon engaged in the manufacture of artificial products, mostly coal tar derivatives, for use in medicine. In the twenty years following the introduction of kairin not far from 2,000 of these had been advertised to the medical profession. Most of them were soon found to have little practical value, but more came on and they are still coming. All classes of important remedial agents have been represented; antipyretics, local and general anesthetics, hypnotics, intestinal and external antiseptics, and a great variety of bodies with special physiological properties.

It is not hard to imagine the result. The most extravagant claims were made for many of these new compounds, and it was indeed an able and independent physician who could dare to refuse to be imposed upon by their promoters. Unfortunately, the great body of medical practitioners the world over soon fell victims to the craze for "synthetics," either in their original form as they came from Germany, or in the form of imitations or mixtures as put out by other houses. It is not too much to say that the use of many of these newer remedies soon became a veritable scandal. Of rational therapeutics little was left, and, apparently confused by the wealth of things offered, physicians were often only too willing to follow the advice of the agents of the medicine houses. Acetanilide alone has made millions for those who have pressed it in a business way, under new names. As acetanilide its value and also its dangers soon became known to the body of physicians, as a whole, and in this form it is safe to say that its use has seldom been excessive. But mixed with a

little caffeine and soda as antikamnia, and praised as an original and newly discovered synthetic, it soon found a market where it was sold in enormous quantities. Chemists pointed out the facts, but physicians were easily duped, and some departments of the United States government even bought antikamnia for their hospital stores. The fortunes made in this product stimulated a dozen or more imitations, and ammonol, orangeine, phenalgin, salacetin and other mixtures containing acetanilide as the chief active constituent were soon on the market, advertised as new and valuable remedies. Most of them, like the antikamnia, contained caffeine.

That a new remedy hailed from Germany, and that its use was backed up by the favorable opinion of almost any doctor of that country was considered sufficient to justify its use here, where therapeutic experimentation had sunk to the level of trying almost everything which came along.

The business of manufacturing proprietary remedies ready for use grew to enormous proportions, and unfortunately the main element in selling many of them was the air of mystery with which they were surrounded. In the old *materia medica*, while the situation was bad, it was not so entirely hopeless. The average physician had always seen and certainly knew something about calomel, cinchona and opium, but the things with the long high-sounding names, made in Germany, were clearly beyond him. He naturally and easily dropped into the position where the pseudo-scientific jargon of the glib-tongued detail man of the medicine factory overpowered him.

I am talking of the position of physicians, as a class, but fortunately there was a saving remnant. Not all of our American practitioners were fooled by the campaign of advertising madness. Not all of

them were swamped by the flood of proprietary remedies which flowed from the medicine factories in an ever-increasing stream. A remnant remained to attempt the saving of therapeutics and the wiping out of the disgrace of proprietary enslavement. In this remnant were a number of men active in the councils of the American Medical Association and they were sufficiently alive to the seriousness of the situation to undertake a reform. The *Journal* of the association was the medium through which the reform was begun and primarily, perhaps, because here the need became the most apparent. The *Journal* has had a wonderful growth in the last two decades and much of our best medical research is published in it or reviewed by it. At the same time in its advertising columns the praises of some of the worst products of the medicine factories were sounded. The incongruity of the situation was apparent. Where is the sense, it was asked, in advocating modern and scientific therapeutic measures, supported by pharmacological evidence, if but a few pages away a dozen *ols* and *ins* and *phens* are advertised in exaggerated terms, and about which no man knows anything. This irrational relation should be reformed, but how?

The way in which the reform was effected and the far-reaching consequences of the same developed somewhat slowly. The editor began by consulting a small group of chemists and pharmacists regarding the possible or probable merits of a number of substances offered for advertisement, with the hope of developing some scheme by which objectionable matter might be easily weeded out. Naturally the editor and the advertising manager of a journal could not be expected to pass on the reasonableness of the claims for a complex new synthetic. This is the province of men trained in chemistry and pharma-

cology. In these consultations it was soon recognized that it would be possible to reject many articles on account of glaringly false statements made. As contracts for some doubtful products expired the manufacturers were informed that they would not be renewed until the truthfulness of the claims could be investigated. To investigate such claims and others growing out of the work it was seen that a committee or council would be necessary, and the composition and functions of such a body were the subjects of many conferences between men interested in the outcome of the work. Finally, the Council on Pharmacy and Chemistry was organized in the spring of 1905 and this body after much correspondence and a number of meetings formulated rules of procedure.

It was seen at the very outset, however, that the work of the council should not be limited to the study of medicines advertised in the *Journal* of the American Medical Association, or there offered for advertising, but should embrace an investigation of all new articles advertised to physicians, the results of the investigations to be published in the *Journal* and later in book form under the title of "New and Non-official Remedies." It was understood, however, that the studies of the council could not be extended to the thousands of products advertised in the lay press to the general public. Many of these articles are little better than frauds, to be sure, but the work of the council could not be made to include them. As an almost necessary limitation it was agreed that the studies and investigations of the council should be devoted to the articles advertised to physicians only.

As it was first organized the council consisted of twelve men, divided into three groups or committees, on chemistry, pharmacy and pharmacology. The present

membership embraces sixteen men, a new group, therapeutics, having been added. As it has been my privilege to be a member from the time of organization I can best explain the work accomplished by speaking in the first person. The membership of the council is made up by vote of the trustees of the association and the appointments are for a term of years. The present membership includes the following men and it will be seen that there is a fair geographical distribution, as well as institutional representation: J. A. Capps, Rush Medical College; D. L. Edsall, University of Pennsylvania; Otto Folin, Harvard Medical School; C. S. N. Hallberg, University of Illinois School of Pharmacy; R. A. Hatcher, Cornell University; Reid Hunt, Hygienic Laboratory of the Public Health and Marine Hospital Service; L. F. Kebler, U. S. Department of Agriculture; J. H. Long, Northwestern University; F. G. Novy, University of Michigan; W. A. Puckner, Laboratory American Medical Association; J. O. Schlotterbeck, University of Michigan; G. H. Simmons, editor *Journal American Medical Association*; Torald Sollmann, Western Reserve University; Julius Stieglitz, University of Chicago; M. I. Wilbert, German Hospital, Philadelphia; H. W. Wiley, U. S. Department of Agriculture.

Meetings of the whole body are held at frequent intervals and there is an annual meeting in Chicago. Most of our work is naturally done by correspondence and by the circulation of a weekly bulletin. It must be added that the services of the council are without any compensation.

It is well known that acetanilide, or phenylacetamide, is a very powerful and at the same time a somewhat dangerous remedy. It is much used by physicians, but as so employed in the free form has seldom caused fatal results. Not so, how-

ever, when it is dispensed under a misleading name in quantities beyond the safety limit. Most of the headache cures sold in tablets so freely in the last few years contain acetanilide, and because they are advertised as safe they are often used in excessive amounts, with sudden death as an occasional consequence. Five years ago many of these headache cures were distributed from house to house in free samples and they were advertised in the medical and the lay press. Several of them were manufactured by companies which had grown rich in the business, and it was recognized that the companies might fight our efforts. To show our own strength and interest in the matter and determine just what could be actually done we decided to take up this difficult problem first, and therefore began examinations of the products known as antikamnia, salacatin, ammonol, orangeine, Koehler's Headache Powders and phenalgin. These things had been paraded as discoveries of rare value and true and new synthetics, in some instances. In the advertising literature of some of them the dangerous acetanilide was warned against.

As was to be expected the work of our committee showed that each one of these highly praised cures contained acetanilide as its main constituent, and usually in combination with caffeine and sodium bicarbonate. In the samples of the several products as bought in the market the amounts of acetanilide ranged from 43 to 76 per cent. The report of the council was signed by the five men on the committee of chemistry, Long, Puckner, Sadtler, Stieglitz and Wiley, the work having been done in the five laboratories represented, and independently. This report was published in the *Journal* of the American Medical Association, June 3, 1905.

It is putting it mildly to say that the pub-

lication of the first report, taken with the previously announced program of the council, created consternation among the manufacturers of dishonestly advertised proprietary remedies. Abuse came to us from many quarters and articles were sent out to physicians all over the country denouncing the presumptuous work of an irresponsible council which should undertake to tell physicians what they should or should not use. St. Louis has long been the home of a large number of fake medical preparations and from that city a vicious pamphlet was sent out by the thousands under the euphonious title "The Arrogance of Ethics," in which the *Journal* of the American Medical Association, its editor and the Council on Pharmacy and Chemistry were severely handled on account of the meddlesome work they had undertaken.

Certain interests associated with the acetanilide exploitation even went so far as to threaten law suits against us. The suits, however, were never started. Our committee would have found pleasure in defending them. Two firms in other lines, seeing what had been done for acetanilide, notified us through their lawyers not to publish anything concerning their products. This advice was wholly unnecessary as far as one of the products, bromidia, was concerned, as the method of advertising it made a study unnecessary. Some of the products of the other firm have since been examined and condemned. The council has no fear of punishment for any work it is doing, which, as mentioned, is absolutely voluntary and without compensation.

Our work was now pushed vigorously, and to make plain its basis it is necessary to explain the sources from which the physician draws the remedies he prescribes. These sources may be classed as follows:

(a) There is first the "Pharmacopœia

of the United States," which is a work revised every ten years and which contains descriptions and formulas for remedies that have been so long in use as to be considered as standard. There is no secret about their preparation and they may be made and sold by any one. But the fact that they are contained in the "Pharmacopœia" does not mean that they are valuable remedies. In fact, many of them are not. The preparations of the "Pharmacopœia" are called official and the book has legal standing in the United States.

(b) We have next the so-called "National Formulary," which is a compilation of remedies selected by the American Pharmaceutical Association. The articles described here have not the wide use of those in the "Pharmacopœia." Some of them are new remedies not fully tried out and some have more of a local reputation. Many of them are good and valuable, and many are not, but their use is sanctioned by the experience of many physicians, apparently.

(c) Third, the so-called "ethical" proprietary products, which are made by processes in a measure secret, or owned by the producing firms. Many of these products are new organic compounds of great physiological activity, while some are mixtures or combinations of long known remedies. Some are good, and some, on the other hand, are bad, even very bad. But as long as these products are made for and advertised to physicians only they have been called ethical as distinguished from the ordinary "patent" medicines which are sold to everybody, and not usually on the prescription of a physician. Many of the manufacturers of this group of products make a point of the ethical character of their wares, the test of "ethicity" being essentially in the method of advertising. A remedy which is advertised directly to

the public, as are the ordinary patent medicines, is said to be unethical, while one which is described in the professional journals for the eye of the physician only is supposed to be ethical. At least this is the way some of the manufacturers interpret the criterion.

If to be ethical it is simply necessary to advertise in medical journals only, it is very easy to keep within the ethical pale. To publish one's own medical journal is all that is called for, and it may occasion surprise to learn that probably half a dozen journals in this country are published by manufacturers to advertise their products. This fact is not stated on the title page, however. Some of these publications have a subscription list, others not. One of the worst of these comes from a small town in Connecticut. The reading matter in them consists of articles purporting to give the experience of the writers with the various remedies lauded in the advertising pages. In this simple way many worthless products become ethical proprietaries. But it must be admitted that many medical journals of greater pretensions are not much better in their advertising matter.

(d) We have, finally, the large group of patent medicines, which are not really patented in the usual sense of the term. The name under which they are sold is ordinarily copyrighted, and their success depends on wide advertising to the general public through the daily press. Many of these articles are mixtures which may have had value for some specific ailment and were often originally popular prescriptions. But in the patent medicine form the composition is not disclosed, and for them much more is claimed than this could possibly warrant. In many cases they contain powerful remedies which should not be used except on the advice of a competent person. They often accomplish re-

sults, to be sure; the soothing syrup contains morphine, why should it not put baby to sleep; the headache and the nerve cures often contain enough acetanilide as the active compound to produce a sleep from which there is no arousing. It must be said, further, that in no case do they contain any remedies not well known to physicians. They are not produced by unusual skill and after long study. The only expensive thing about them is the advertising.

As intimated above, the work of the council is limited to the third group of remedies. Those of the first and second groups are well known, while those in the fourth group are unworthy of notice, as used, except to condemn. It may be urged, and has been urged, that the restriction of the free sale of patent medicines is a limitation of personal liberty, that any man should have the right to buy what he pleases. There are cases in which such right may be conceded, but not where potent or dangerous remedies are bought for administration to helpless invalids or children. Self dosage is always foolish; the dosage of others with remedies of unknown composition may be criminal.

The physician should be fully informed as to the nature of the remedies he is expected to use, and the work of the council is to furnish this information regarding all new things presented to his attention. They should not be employed on the mere guarantee of the financially interested manufacturer.

At the beginning of our work the council adopted certain rules, which if complied with, would entitle articles submitted to us to consideration and report, and to notice in "New and Non-official Remedies" in case they were found satisfactory. At first certain manufacturers assumed a very independent attitude and attempted to

ignore the stand of the council, but the situation to-day is reversed and every firm engaged in the work of producing remedies to be used by physicians is glad to secure our indorsement of its products. Since our experience with the acetanilide mixtures we have been able to pass on the merits of nearly all the new remedies offered in the American market, and many of the older ones also, in the proprietary list. Up to the present time we have examined not far from one thousand compounds and those which appear to have some merit and are honestly advertised are listed and described in our publication mentioned. The publication does not, of course, imply an indorsement of the therapeutic claims.

The importance of the work of the council appears in several directions. It is constructive as well as destructive, and in its future development must lay greater stress on this point, the reasonableness of the claims made for therapeutic value. Thus far we have been mainly concerned in securing from manufacturers complete statements of composition and place of manufacture, general properties and behavior, which are controlled often by very full investigations of our own. We have insisted that in their advertising the manufacturers must abandon the practise of making exaggerated claims as to curative action, which is not only undignified, but often not in accord with facts. Doubtless in the future the work of the council will have to be more critical in this respect. We have admitted to "New and Non-official Remedies," for example, a number of lecithin preparations, but it seems absurd to think that in the quantities in which they are used in a medicinal way they can have any value as nerve or tissue builders or stimulants in nutrition. One or two eggs would doubtless contain more

of real value than several dollars worth of the lecithin preparations in the market. Of the extracts of malt, and the various predigested foods considered, something similar may be said, and probably the council will have to say it.

But in the work of exposing frauds we have rendered a service of some distinct value to the public. Of the thousand or more articles passed upon several hundred have been rejected as unworthy to find a place in our book, and therefore not suitable for consideration, even, by physicians. Thus far I have just said, our findings have been too liberal, rather than too critical. The rejections have been for various reasons and if I had the time I should like to give a list of them. But a few illustrations will suffice.

We devoted much time to the study of a so-called metabolized cod liver oil. The name is a catchy one. We all like to talk of metabolism; it sounds well and apparently means a great deal. Cod liver oil has been used through a long period as a food for consumptives, especially, and great value has been claimed for it, probably without better reasons than might be assigned for other oils. But the taste and odor are bad, which are practical objections to its use, and besides many people have trouble in digesting it, or any oil in fact. Because of difficulties in digestion the so-called predigested foods have come into notice, and I must say that most of them are things which are to be avoided. A firm in a western city attempted to do more than this; it concocted and advertised to physicians a *metabolized* cod liver oil, not only digested, but metabolized. Rightly interpreted this name signified more, probably, than the manufacturers intended. As ordinarily used the term metabolism refers to the sum of the changes through which a substance goes in passing through the

body, and a metabolized fat is properly a completely oxidized product, a mixture of carbon dioxide and water, and therefore of no value as a food. On first examination of the product in question it was found to consist essentially of an alcoholic liquid with sherry wine flavor. Nothing of any value could be discovered in it. When the manufacturers were told of our findings they replied with much display of chemical learning that our analyses were faulty, we must look for *metabolized* oil. They were sure the product contained it, and a member of the firm with a chemist in their employ actually came in time to my laboratory to convince me that we must be wrong in our criticism. They returned home somewhat wiser, but not repentant. This is their scheme of metabolism: The oil was put in a tank with a large volume of lukewarm water, pepsin and hydrochloric acid to digest something, and sodium carbonate and minced or powdered pancreas to digest something else. The mixture was stirred up frequently and finally filtered, and to the filtrate enough wine was added to preserve it. All of the products of the metabolism were supposed to be in the filtrate, while the emulsion-like mass on the filter was thrown away! Notice the absurdity of the whole process. Pepsin and hydrochloric acid, pancreas extract and alkali, fat and water all in one mixture. What the pepsin and acid were supposed to accomplish I could not discover, but even without them the alkali and pancreas could alter or digest but little of the fat under the conditions. The fat was indeed left on the filter, practically all of it, and thrown away.

It seems like a waste of time to discuss such products, but remember they are sold to physicians, used by physicians and often praised by physicians as efficient remedies. The only way to discourage this scandalous

condition is to discover and publish the facts. Recently, and following our exposé of the metabolized oil, the manufacturers have had to face the authorities of the United States Department of Agriculture and have been fined heavily because of the same fraudulent advertising, in violation of the provisions of the Food and Drugs Act.

The next thing I wish to speak of is an "intercellular ferment." This name also sounds well, and it should impress the physician. This particular product is described as a hardy metabolic ferment, useful in tuberculosis, diabetes and various forms of malnutrition. In diabetes the organism gradually loses the power to oxidize or completely metabolize sugars, and these or certain derivatives may appear in large quantities in the urine. It has been a dream of physiologists and pharmacologists to produce a something which might, when taken as a remedy, overcome this difficulty and remove its cause. Many things have been tried. A few years ago Cohnheim thought he had discovered the missing thing in a combination of extracts from muscles and the pancreas, one of which was assumed to act as a catalyzer for the other. This mixture was believed to oxidize sugar rapidly and it was even proposed to make it on a large scale in a factory way in Germany. The American product, made by a New York firm, was claimed to do all the things required of this ideal ferment. It was advertised to contain an active enzyme which would pass through the stomach and intestines, the liver presumably also, and follow the blood stream to the remoter tissues where it would attack and oxidize the sugars with liberation of heat and mechanical energy. This would indeed be a wonder, even if it would not remove the cause of the trouble. The manufacturers

seemed to confuse the two things, as is usually the case. But no proof was ever brought by the concern that it actually had such power, and on the face of it such a claim would appear doubtful. It is too much to assume that any enzyme could traverse so long a path and still remain active.

The substance came to us in the form of a light yellowish powder and in different samples was found to have little or no activity in any direction, or sometimes activity in the direction of converting sugar to lactic acid slowly. At one time a strong starch-converting power was claimed for it and also the power of rapidly digesting fats, but in our experiments these reactions were unworthy of notice. The powder was found to consist largely of a protein substance, apparently casein, and innumerable bacteria, some living, some dead, and resulted from an attempt to grow a certain fungus on a medium containing milk. What took place was this: a rapid development of lactic acid bacteria, with consequent coagulation of the milk, followed and the fungus-like mass which was skimmed off and dried contained, therefore, the casein and entangled bacteria with some molds and a few other growths. The sugar-converting power noticed was due primarily to the lactic bacteria present in vast numbers, and this explained the principal activity sometimes observed. The wonderful metabolic intercellular ferment was really a mass of bacteria and casein!

I know of few products which have been advertised in more high flown language than this so-called intercellular ferment. It was, besides, ethical, and the carefully coached detail men who recited its virtues to the medical profession were examples of good manners, correct dressing and remarkable acquaintance with physiological

terms. I should say physiological jargon, as the talks reeled off would not bear close inspection. It is no wonder that such men make an impression on the half educated doctor. Men are sometimes respected in proportion as they are not understood. I do not know who writes the scientific matter for some of these advertising firms. To the uninitiated it often sounds well, but to the physiologist or chemist the talk may be meaningless. Unfortunately, physicians can not all be sufficiently well trained to detect the frauds in all cases.

As an illustration of another kind of fraud consider the product known as X's Antiseptic Powder. X is a pharmacist of Washington and his manufactured remedies have much more than a local reputation. This powder was advertised as a "scientific combination of borate of sodium, alumen, carbolic acid, glycerin and the crystallized principles of thyme, eucalyptus, gaultheria and mentha," but on analysis we found it to contain boric acid 81.26 per cent., zinc sulphate 15.56 per cent. and a little water and flavoring matters. This was a petty swindle, but the worst of it was that the manufacturer, when confronted with the facts, attempted to excuse them with the statement that he had a right to use what he pleased and call the mixture by any name he chose in order to prevent imitations, as long as the product accomplished what he claimed for it. X claims to be strongly devoted to the ethical principle, and has recently published a little pamphlet in which he says much about honesty in business methods. It is fortunate that under the food and drug laws all such frauds may be punished. The label must be made to tell the truth.

I mention this case, which may appear a very unimportant one, because it illustrates an interesting point. It appears

that at one time the X powder contained the substances, or some of them, as claimed on the label. Later a change or improvement was made, but it would be poor business policy to change the label. I am told that many business men reason the same way about manufactured articles and we have a good illustration in the anti-kamnia, spoken of above. This was an acetanilide mixture at the start, but now, to get around one of the provisions of the drug laws, it contains phenacetin instead, when sold in the United States, and acetanilide, it appears from the last analyses made, when sold in England. There is an element of danger in this practise. One may become accustomed to a certain large dose of the thing here and, thinking he has the same product, get a double dose of acetanilide if he buys it in England. The normal dose of the latter is about half that of phenacetin. Where are the "ethics" in such a practise?

As acetanilide has flourished under many aliases so hexamethyleneamine has appeared in a variety of forms. It has figured as urotropin, formin, cystogen, aminoform, hexamin, urotone and others. Uron is another preparation containing the same substance, and hails from St. Louis. The manufacturers give it the complex formula $\text{LiC}_{15}\text{H}_7\text{N}_4\text{O}_2$, but it appears to consist essentially of 58 per cent. of lithium benzoate and 42 per cent. of hexamethyleneamine.

Another firm advertises a remarkable salt under the name thialion, for which the chemical term sodio-tri-lithic-anhydrosulphate is given as a synonym. A beautiful graphic formula is added which reminds one of the first attempts of the freshman. The product actually contains sodium sulphate, sodium chloride, sodium citrate and a little lithium citrate. The journal in which this wonder has been extensively ad-

vertised is apparently owned by the medicine company, and is known as the *Uric Acid Monthly*. Ethics again!

All such things and many more are plainly frauds and easily disposed of but other articles come to us with which there is greater difficulty. One illustration may be given. Following the success of atoxyl, which is sodium arsanilate, a number of derivatives and imitations have appeared. Some of these are of the same general character, which may be established. But for other bodies containing arsenic and aromatic radicals the evidence is not as easily brought, and frequently considerable investigation is necessary to get at the facts. Unquestionably we shall now have a greater flood of aromatic arsenicals, since the discovery of the preparation known popularly as Ehrlich's 606 has called attention anew to the possibilities in this field. There will be many imitations and many things urged upon physicians as identical products. All such offerings will have to be investigated, and some of this work may possibly lie within the province of our council.

Our five years of effort are beginning to bring results. The better medical journals are becoming more careful in the admission of articles to their advertising columns, and a number are following closely the announcement of reports in the *Journal of the American Medical Association* and "New and Non-official Remedies" to the extent that they advertise no remedy which has not been approved by the council. Some of the newspapers of the country are dropping absolutely the advertising of medicines and medical appliances of all kinds, and there is now the certainty that this reform will spread.

We have reason to feel gratified by the success achieved, but a much greater work is ahead of us or some other body which

may feel better able to take it up. It is not sufficient to establish the honesty of the claims made for a remedy or for its general behavior. More than this is necessary. The time is coming when some body of scientific men will be called upon to decide very definitely upon the accuracy and reasonableness of the therapeutic claims, and to draw a pretty sharp line between the good and the bad. To some extent this is being done now by our committee on therapeutics, but it was not so at the beginning, when we did not think it wise to attempt to decide questions of actual curative merit. At the start it was enough to secure a more rational tone in advertising with the elimination of all marked exaggerations; now the need of something more is seen and the council may attempt it. To fix actual therapeutic values is no easy task and to do it for all substances would more than tax the powers of the council, since much of the information desired can be obtained only by combined pharmacological and clinical study. Who can afford the time or energy for this? Sooner or later such work will have to be done by research institutions endowed for the purpose and the present work of our council may be taken as suggestive of the great need for effort in this direction.

There is a direction, however, in which the work of the council may be of importance in the immediate future, and in which the solution of the more elaborate problems hinted at may not be attempted. I spoke above of the "Pharmacopœia" and its revisions. A few months ago a committee was appointed to begin the regular decennial revision, the revision of 1910. As each ten-year period comes around the question of what should be dropped and what should be added comes up for discussion. This time the discussion promises to be a very animated one, as the more pro-

gressive of our physicians are calling for a thorough revision along lines suggested by the advances of modern chemistry, with the elimination of much of the old matter. On the other hand, certain things should be added from the newer remedies and the work of the council should give an insight into the value of some of these. A study of our work will show that by far the larger part of it is devoted to an examination of things which have, or claim to have, a fairly definite chemical composition, and this illustrates an extremely important point, viz., the gradual passing of an old system. The pharmacopœias of earlier times contained the descriptions of a large number of vegetable drugs and their aqueous or alcoholic extracts, and very naturally constancy or uniformity in composition was hard to secure. Extracts were made by percolating or otherwise treating a certain weight of the crude drug with a certain weight of the solvent, but there was no evidence to show that a tincture of aconite, for example, made from one lot of the root would contain the same amount of the active principle as a tincture made from the same weight of another and different lot of the drug. Before the day of chemical assays the same uncertainty obtained for all galenical preparations, and even yet is not entirely avoided. It must be remembered that crude drugs differ as do gold mines; some are rich and some are poor in the thing desired.

The tendency in recent years has been to replace the uncertain root or leaf or bark by a definite weight of the active principle present, the tinctures of cinchona, for example, by the proper weight of the alkaloids, and *nux vomica* by the pure strychnine. The preparation of new remedies becomes therefore largely a matter of chemistry, and in the end the chem-

ist will be called upon to answer as to the probable value. I use the term "chemist" here in the broader sense, including the specially trained pharmacologist, and wish simply to emphasize my belief that in the pharmacopœias of the future the criterion of chemical purity must be much more rigidly enforced than in the past. The developments of organic chemistry have made this possible.

It is also probable that in the pharmacology of the future the study of the relation between intimate chemical structure and physiological action will play an increasingly important part. Pharmacology is indeed concerned largely with just such studies, and the prediction of action from the constitution is a not impossible advance. There is already the accumulation of a great deal of evidence bearing on the effect of introducing various substituting groups for hydrogen of aromatic radicals. Consider, for example, the different toxicities of the several hydroxybenzenes, the difference between benzoic acid and salicylic acid, the difference between acetanilide and phenacetin due to the presence of an ester group in the molecule of the latter. The possibilities in this direction are shown most emphatically in the remarkable series of artificial cocaine derivatives. Hundreds of these have been made, and among them we have bodies of considerable usefulness, the eucaines and stovaine, for example, along with many of no apparent value. With the great number known it should be now possible to discover by experiment the reasons for the activity in some cases, or the inertness in others. The question of therapeutic value should be worked out for all such substances and as knowledge advances it is hoped that the measure of value may be based on chemical properties and structure.

The revision of the "Pharmacopœia" from such a point of view would be an ideal work, but of course could not be consistently carried through at the present time. But a beginning may be made and in this the council may indirectly lend a hand. Our work is primarily for the good of medicine. The physician can not follow the highly specialized developments of physiological chemistry or pharmacology and he has the right to ask that the facts which he needs for use be put before him in sharp and unequivocal terms. In the past physicians have paid too little attention to the actual composition of the remedies they use, leaving this largely to the pharmacist. But in the newer developments in the use of curative agents they must have more of this exact knowledge, and there is no body better qualified than the American Medical Association to collect and classify this knowledge. The work of the association in the cause of medical education has been of enormous value, and the education of the physician in the field of rational therapeutics is but a natural and legitimate specialization of the general activity.

As already intimated it may not be practicable for a body organized as is the present Council on Pharmacy and Chemistry to proceed with a program as elaborate as the one just suggested. Possibly a new and permanent commission may have to undertake it and a natural outgrowth of the work of such a commission would be the gradual creation of a pharmacopœia suited to the actual needs of the American physician.

J. H. LONG

*THE TWOFOLD FUNCTION OF THE
UNIVERSITY*¹

THE ideal university, like the ideal state, is yet in the utopian stage. That a vigor-

ous university is necessary to the life of a vigorous state is a principle or policy generally admitted and acted upon, not only by the European peoples wherever they are located, but also to an ever-increasing degree by those other races of mankind which have been brought under the immediate influence of the dominant civilization of the world. One can, however, still find communities, happily dwindling rapidly in number, on this American continent, where it is necessary to plead for the very existence of a real university. The need of such an institution is obscured by the fact of the community's parasitical dependence upon their more enterprising and far-seeing neighbors, from whom they get their supply of educated professional men.

Wherever the university is firmly established in the appreciative intelligence of the people it is conceived to have many functions. Such are seen in its relation to the state; its relation to the professor; its relation to the student; its relation to the discovery of truth; and its relation to the advancement of the civilization of the world.

The conception of the university as merely an intellectual restaurant to prepare in the most readily assimilable form a certain definite amount of mental food for a certain number of students every year is essentially an unworthy one. Yet I believe it is not an exaggeration to say that a large proportion of the higher institutions of learning in America (I use that word in its geographical sense) have regarded their duty as almost entirely performed when their students, having been lectured to with all possible diligence for several years, have been provided with

McVey, LL.D., and the celebration of the twenty-fifth anniversary of the founding of the university. Later this was given as the university address at the opening of the session of the University of Manitoba.

¹ An address delivered on September 28, 1910, at the University of North Dakota on the occasion of the inauguration of President Frank L.