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*American Medical Association. Committee
on Adulterations and Sophistications of Drugs,
Medicines, Chemicals, etc.*

REPORT OF THE COMMITTEE

ON

ADULTERATIONS AND SOPHISTICATIONS

OF

DRUGS, MEDICINES, CHEMICALS, ETC.

PRESENTED TO THE

AMERICAN MEDICAL ASSOCIATION,

AT ITS THIRD ANNUAL MEETING, HELD IN CINCINNATI,

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REPORT ON
ADULTERATED DRUGS, MEDICINES,
CHEMICALS, ETC.

The Committee on "Adulterations and Sophistications of Drugs, Medicines, Chemicals, &c.," present the following

REPORT:

THE resolution of the Association under which the committee is constituted instructs the members to "note all the facts that come to their knowledge, with regard to adulterations and sophistications of drugs, medicines, chemicals, &c.," and to report them at the next annual meeting.

Although the terms "drugs," "chemicals," &c., properly comprehend substances used in the arts, as well as in the treatment of diseases, the object of the Association, it is presumed, was to inquire after such merely as are employed for therapeutic purposes, and the committee have restricted their investigations accordingly.

That many of the articles used as medicines are of very inferior quality, and a source of much vexatious disappointment in practice, is the physician's daily experience; and that the more energetic and costly are frequently sophisticated, no one doubts;—but to obtain a sufficient number of "*facts*," properly avouched, and not contained in publications already familiar to the profession, to form a report of much value, or one likely to satisfy the expectations of the Association, has not been found an easy task by those to whom the duty has been assigned.

In appointing so large a committee, composed of delegates from most of the States of the Union, it was doubtless expected that many facts would be collected, and that information on the subjects referred would be obtained, from every part of the country; but, although eight months have elapsed since the members of the committee were informed of their appointment, and their active cooperation requested by the chairman, not a fourth of them have responded, nor have one-half of the States been heard from. This

seeming negligence should not be ascribed to any want of interest in the subject, or disinclination to promote the laudable objects of the Association, but to the inherent difficulties of the investigation. In fact, many of the communications received by the chairman contain little else than expressions of this kind.

The special examiners of drugs appointed by the government, when called upon, have in every instance manifested a zeal and readiness in communicating such information as they were possessed of, highly creditable to them and satisfactory to the members of the committee. Although, in some instances, dealers in drugs have shown an indisposition to answer questions, or in any way promote the objects of the Association, there have been many honourable exceptions among them, and it is to these that we are chiefly indebted for what we know of domestic adulterations. Still, it must be confessed that less assistance has been derived from that source than was anticipated. They who fabricate and vend spurious articles are cautious not to criminate themselves; whilst honest dealers know but little of the trickeries of those who are engaged in the discreditable business, and are naturally averse to embroiling themselves by becoming informers. Nor are physicians, as a general rule, capable of giving the desired information. Although often disappointed in the effect of the remedies they administer, the circumstances which influence these results are too numerous, and the conclusions to be drawn from such failures too uncertain, in most instances, to authorize any positive deductions as to the qualities of the articles employed. And, withal, comparatively few have enjoyed the requisite opportunities for becoming critically acquainted with the sensible properties of drugs, and still fewer are sufficiently skilled in analysis to be able to detect fraud in their composition.

These circumstances will account, in part, for the limited character of this report, and also for the fact, which it is proper should be stated, that nearly all of the information contained in it is derived from the larger cities. To Doctors Jackson and Bowditch, of Boston; Reyburn and Johnston, of St. Louis; Frost, of Charleston, and Upshur, of Norfolk, especially, the Association is largely indebted for their zealous efforts in the prosecution of these inquiries. It is a subject of regret, however, to the chairman of the committee, that most of their reports came into his possession at a period too late to enable him to do justice to their authors, or to the subject.

The information obtained by the committee may be appropriately considered under two general heads: viz., *First*, as it regards *foreign*, and *secondly*, *domestic adulterations*.

1st. *Of Adulterated Drugs imported from abroad.*

For a large number of our most useful medicines we are, and ever must be, indebted to foreign countries. Such are camphor, Peruvian bark, opium, ipecacuanha, columbo, jalap, rhubarb, &c., and, until a few years back, nearly all our chemicals were likewise imported.

Our druggists either order their supplies through the agents of parties residing in the countries where they are produced, or, which is more generally the case, purchase them from those to whom they are consigned, the greater number of these being denizens of the city of New York. These agents, or consignees, are mere *factors*, whose business it is to forward orders, and dispose of whatever is sent to them to sell. They seldom have much knowledge of the qualities of the articles that pass through their hands, and have no interest beyond the commissions they receive for their negotiations. So long as the market in this country was open for inferior or sophisticated drugs, it was the interest of those abroad to send hither whatever could not be sold at home. Hence, previously to the passage of the law for the inspection of drugs, the importations were of the most heterogeneous character. Good and bad, adulterated and pure, separate and mixed, according to the interests of dealers, deluged our market and filled our shops.

The operation of this law, although in some instances productive of inconvenience, has in many respects been beneficial.

Importers are admonished by it of the impropriety of trafficking in adulterated and spurious drugs and medicines, as well as discouraged by the forfeiture it works. It has stamped the practice with the seal of public condemnation, and, by calling attention to the matter, has awakened a wholesome jealousy in the minds of physicians and apothecaries, and thus improved the general tone of feeling on the subject. The American market is no longer flooded with foreign adulterated medicines, and even those of inferior quality, although unadulterated, are in a great measure excluded. By shutting out all such, a demand has sprung up for prime articles, which were previously unknown in our drug stores; so that, already, a sensible improvement is perceptible.

The inconveniences to which the law has given rise relate mainly to manufacturing purposes, and proceed from the difference in views and qualifications of the officers appointed to administer it. Thus, articles, good of their kind, often differ in their relative value; and the modes of ascertaining their value, pursued by different investigators, may differ so much as to cause great contrariety in results.

Peruvian bark, for instance, which will yield one or two drachms of quinia to the pound, may be deemed sufficiently good to be passed by one inspector, and condemned by another, because it does not contain half an ounce. Opium, the product of the same soil and climate, and prepared with the same care, will vary greatly in the per centage of morphia it will yield, in different seasons, and according to the amount of water contained in it. When recently made from the poppy, it contains a large amount of water, much of which is lost when kept some time, although unchanged in other respects. The article varies, too, as it is produced in different countries, from the influence of soil and climate—East Indian from European; Turkish from Egyptian, &c.—and yet each of these may be advantageously imported for manufacturing the salts of morphia, although not suitable for galenical preparations. Now, according to the views of different inspectors, one variety may be admitted at one port and rejected at another; and the same variety, or even samples of the same parcel, may be differently disposed of, according to the greater or less accuracy of different analysts. In fact, the argument is not altogether hypothetical. An invoice, condemned at one port as below the proper standard, after being sent out of the country, has been re-imported into other districts, and passed as good. Iodine, not sufficiently purified for ordinary pharmaceutical purposes, may be well adapted for manufacturing iodide of potassium and other chemical preparations, in consequence of its lower price. And so likewise of other things.

These remarks are important from their bearing upon the domestic manufacture of some of our most valuable chemical remedies. In no part of the world, at the present time, are the various chemicals employed in medicine prepared of better quality than in the United States; and, when we consider the guarantee we have for their purity in the responsibility of manufacturers residing among us, alive to their reputation, and interested in exposing and putting down fraudulent imitations and adulterations, no impediments should be thrown in the way of, but every encouragement given to, our home manufacturers. Some modification of the present law, to obviate the difficulties referred to, is believed to be necessary by several of the special examiners, and it is to be hoped that those more immediately interested will be able to procure such changes, either in the terms of the law or its construction, as will remove all just causes of complaint, without interfering with the humane objects for which the law was enacted.

In proof of the salutary operation of the law of Congress on this subject, it is only necessary to state that the inspectors for the ports of Boston, New York, and Philadelphia all say that the amount of impure drugs, and those of inferior quality, which has come under their notice within the last twelve months, is far less than during the preceding year. In a letter from Dr. Bailey, special examiner for the port of New York, dated on the 29th ult., addressed to the chairman, he says: "Of medicinal chemical preparations, the quantity condemned (within the last year) has been small. The present law seems to have put an effectual check to the importation of impure and spurious articles of that description. The importation of impure *opium* has greatly fallen off. I have not condemned *one-quarter* the quantity during the past twelve months that I did during the nine months previous; and the same may be said of many other important articles. As far as *this port* is concerned, the *standard of drugs has been materially raised by the operation of the present drug law.*" The same observation applies to the other large importing cities.

2d. *Of Home Adulteration.*

Being protected, in a great measure, from the introduction of adulterated medicines from abroad, it becomes interesting to know whether cupidity, aided by science and the characteristic ingenuity of our countrymen, will not soon supply, if not exceed, the abuses from former sources.

The attention of several members of the committee has been particularly directed to this subject, and it is satisfactory to learn that, thus far, there does not appear to be any *increase*, but, probably, a *diminution*, in the domestic sophistication of drugs. Certainly, if we leave out those whose chief business consists in the scandalous fabrication and sale of *nostrums*, adulterated medicines are not commonly vended in our large cities, except under the particular circumstances presently to be mentioned.

To determine this point, some of the physicians of Boston had "an analysis made by a competent chemist of a few articles purchased from various druggists and apothecaries in that city. Thirteen specimens were procured, from, 1st, the *wholesale druggists*; 2d, the *superior apothecaries*; 3d, *minor apothecaries*. The results of this analysis were more favourable than could have been anticipated. Only four out of the thirteen articles failed of being of the standard purity, viz., Turkey rhubarb and bitartrate of potassa, bought of the first class; yellow cinchona procured from one of the second class;

and ipecacuanha from one of the third. The rhubarb was one-half, the cinchona one-eighth, of its proper strength; the bitartrate of potassa contained ten parts of foreign matter, and the ipecacuanha was half the strength it should have been."

A member of the committee from Missouri undertook similar investigations in the city of St. Louis, but with results less satisfactory. He analyzed various samples of mercurial ointment sold there, and generally purchased in the eastern cities, and "*in every instance,*" found "*a large deficiency of mercury;*" and he was told, by reliable authority, that the ointment was sometimes prepared in St. Louis "by mixing a small portion of the genuine ointment with cerate, and giving it the requisite blue shade by the addition of crude antimony." An examination of fifteen samples of blue mass discovered great inequalities in strength, with deficiency of mercury in all. "One-third only gave an approximation" to the officinal proportion of the metal. "In some of the samples, it was evident that materials not known to the officinal formulæ had been intermixed." Among the samples tested were some, noticed in the druggist's catalogues as "*English mass in bladders,*" bearing a label with the English arms, and simple title, "English blue mass."

The same gentleman ascertained that the powders of the roots and barks sold in the shops were largely adulterated in many instances, and that of these ipecacuanha was especially inert. "The roots, leaves, barks, seeds, and flowers," he found to be "generally far inferior in quality to the same articles kept for city sale by eastern druggists." The alkaloids and their salts, as quinia, strychnia, morphia, &c., manifested less of intentional fraud. Nitrate of silver was of various degrees of purity and of corresponding price. The vegetable extracts were exceedingly variable in quality and effects; and a like inferiority was noticed in the essential oils, as well as various other articles.

Although this is certainly an unfavourable account of the quality of the medicines sold in a large section of the country, it affords no evidence of an increase in the practice of adulterations since the foreign were excluded.

Extensive observations in Philadelphia, and some inquiry in the city of New York, by the chairman, have satisfied him that adulterations are looked upon with greater disfavour, and actually less practiced, than formerly. The same is believed to be true in Boston, and probably also of all parts of the country. In the latter city, a respectable druggist, in conversing on the subject with a member of

the committee, said "that he did not believe that home adulterations had augmented since the passage of the law, and the reason he gave was, that the fact that Congress had passed such a law had drawn public attention to the whole subject in such a manner that home adulterations could not be practiced with so much impunity as formerly."

A practice seems to have grown up amongst druggists of respectable character, in many parts of the country, without intention of fraud, of making and vending some of the most important officinal articles of different grades. It is sufficient to mention two or three examples to show the gross impropriety and danger of the custom.

One of the least important of these is the spirit of nitric ether, which may be purchased wholesale at prices varying from eight cents the pound up to twenty-five, according to the demands of the purchaser. The chief constituent is water, with just as much alcohol and nitric ether as the price will warrant. Nitrate of silver is made and sold regularly by our best chemists of two grades, No. 1, or pure, and No. 2, containing but sixty per cent. nitrate of silver, the remainder being nitrate of potassa. In some instances, both in this country and in the cities of Europe, the article contains as much as seventy-five per cent. of the latter salt. There is no attempt at concealment in these cases; on the contrary, the adulteration is frankly stated in the advertisements of the chemists and druggists.

A still worse instance is the variable strength of laudanum. Many apothecaries, in making it, are not careful to follow the directions given in the Pharmacopœia. Instead of using *Turkey opium*, in *powder*, inferior varieties are employed; and too frequently, in the *recent state*, and consequently, containing a good deal of water, and therefore a less per centage of the alkaloids. Others are in the practice of making two kinds: one, of the strength directed in the Pharmacopœia, called *Physicians' Laudanum*, which is used in making up physicians' prescriptions; and the other, of about half that strength, either made from the dregs of opium remaining after preparing the officinal, alone, or with an additional quantity of the drug, but still causing the tincture to be of greatly reduced strength. The latter preparation is sold at the counter to the non-professional and country storekeepers, under the name of *Customers' Laudanum*. The dangerous consequences of this outrageous practice must, one would think, be apparent to any one of common understanding, and yet men of respectability are guilty of it continually. Numerous in-

stances of death have occurred, mostly in children, from the use of the stronger article, in the doses to which the individuals had been accustomed of laudanum procured from other apothecaries. Such consequences must inevitably result where preparations differing greatly in their properties are sold under a common name.

Great complaint is made, and with justice, of the frequent adulteration of powdered drugs. Retail apothecaries, physicians, and country storekeepers generally buy their supplies of these from the wholesale druggists in the large cities; and whatever adulterations are perpetrated occur, therefore, either with the drug merchants or those who follow the business of grinding and powdering. Considerable inquiry has led to the conviction, however, that, in the majority of instances, when the quality is bad, it is in consequence of the crude article, from which the powder is made, being deteriorated or of inferior quality, rather than from the admixture of foreign substances.

Generally, the wholesale druggists purchase their roots, barks, &c., in the crude state, and have them ground under their own direction, and, consequently, have the articles pure. But sometimes dealers even on a large scale are not so scrupulous; at least, they manifest no repugnance to providing low priced articles for those whose only care is to buy them cheap.

An amusing anecdote was told to one of the committee of a druggist in a large city who sent some ipecacuanha to be ground. Not being returned as expected, an explanation was asked, when he was reminded that *he had not sent the liquorice root!* In another case, a grocer, when bargaining for making cream of tartar out of the crystals, inquired of the grinder *how many barrels of flour* he should send! Although the grinders and powderers probably mix only the substances sent to them for the purpose by those who employ them, they are, at least some of them, but too willing instruments in the detestable business. One of them avowed to a member of the committee that he had no scruples on the subject; that it was his business to grind what was sent to him; and that the responsibility in regard to the objects for which they were to be employed did not belong to him. With the knowledge of these things, frankly admitted, it is incumbent on the members of our profession to look more closely to the quality of their powdered drugs, and either purchase them in the crude state, or procure them of druggists of undoubted respectability, without expecting, however, that the manufactured article will be supplied to them at less than the cost of the crude material.

A brief account of the adulterations still to be found in the market will afford some idea of the present extent of the evil.

1st. *Of Roots.*

Jalap, in the root, is abundant and of good quality, and, when mixed with bryony and other roots, is easily distinguished; in powder, it is largely adulterated, mostly with the spurious or false jalap roots, or, as the committee have ascertained, with *liquorice root*. In several samples purchased from respectable drug houses in New York, by some of the physicians in Virginia, the odour and taste of the liquorice were very perceptible, and treble the usual quantity was required to produce catharsis.

Rhubarb.—Excellent samples, both of Turkey and East India rhubarb, may be found in most of our drug shops; but, in powder, it is greatly adulterated. Either the mouldy and spoiled pieces in good lots are picked out for the purpose, or the English is ground with small portions of the better quality, or else alone and coloured with turmeric, to give it the proper hue.

Ipecacuanha, in the root, is readily known by its peculiar annulated appearance, and is not apt to be adulterated in that state; but, in the condition of powder, it is extensively adulterated. Frequently it consists of only ten or fifteen per cent. of genuine ipecacuanha, mixed with liquorice or sarsaparilla. Sometimes, the powder of one of these, mostly the sarsaparilla, with tartrate of antimony and potassa, without a particle of ipecacuanha, is sold under that name. This is a vile fraud, and one liable to produce dangerous consequences.

Peruvian bark.—In the state of powder, the Carthagena and other inferior barks, either alone, or in large proportion, are regularly sold for the best Calisaya and crown barks. These of course contain little or none of the valuable alkaloids.

The powders of *ginger and mustard* are very rarely sold in the pure state.

Extracts.—In former years, it was difficult to get the various vegetable extracts of good quality, sometimes from their fraudulent adulteration, but more frequently, perhaps, from lack of skill and care in their preparation. Scarcely any could be relied on except some imported from Germany, and Apothecaries' Hall, in London. Now, however, we have them prepared of excellent quality at home, particularly by some of the principal druggists of Philadelphia, and by Messrs. Tilden & Co. of New York. The latter have embarked largely in the business, and manufacture them of very fair quality. Still, the committee hear much complaint from various parts of the country of the inefficiency of this class of remedies.

Extract of colocynth is extensively adulterated. In some instances, it is alleged, not a particle of colocynth is employed in making it, but the whole consists of the inferior qualities of aloes, with some other worthless ingredients.

Gums and Gum-resins.—*Gum Senegal* is sometimes bleached and sold as gum acacia, alone or mixed; sometimes in lumps, but more commonly in powder; and occasionally wheat flour and arrowroot are mixed with the powdered gum in large proportion.

Scammony.—This drug is almost universally adulterated. There is no reason for believing that this is done in the United States, and we may therefore hope, when the stock at present on hand is exhausted, that the inspection law will guard us from further imposition. Of the samples examined, instead of from sixty to ninety per cent. of resin, many contained but fifteen or twenty, the remainder being made up of chalk, starch, &c. &c. Some specimens abounded in fecula, and were actually worm-eaten. The sole reason why we have not scammony of good quality in our market arises from the penurious disposition, too commonly evinced in the purchase of medicines, of buying at low prices. Virgin scammony readily commands six to eight dollars a pound, while the trash usually found in the shops is bought for two and a half or three dollars! In fact, very little of good quality has been in the markets of this country for the last twenty or thirty years, notwithstanding it is to be had at all times in the large cities of Europe by paying a fair price for it.

Senna.—In this country, we are chiefly supplied with the Tripoli and India varieties of senna. The first of these, although much broken and unsightly, operates very well, and therefore should not be rejected. Alexandria or Egyptian senna is exceedingly rare, although the leaflets of several kinds are frequently sold under that name.

Castor oil, which is a product of our own country, and abundant and cheap, is, nevertheless, occasionally adulterated with lard oil. This, although not positively injurious, increases the dose, and is fraudulent.

Croton oil, being an expensive article, and readily adulterated, is often found impure and comparatively inert. The adulteration generally consists in mixing with it a large proportion either of olive oil or oil of almonds. Both the ingredients being fixed vegetable oils, the fraud is only discovered by the want of activity of the medicine in the usual dose, as well as when applied to the skin.

The *essential oils* are, nearly all of them, frequently adulterated.

The process is to mix a small portion of pure oil with alcohol, oil of turpentine, &c. Lately, *it is said*, a very ingenious method has been adopted of mixing castor oil with chloric ether in such proportions as to make the fluid of the specific gravity of the particular oil to be sophisticated, and then adding a fourth of the genuine oil to give to the mixture the peculiar odour and taste required.

Cod-liver oil, which has become a favourite of late, is extensively adulterated with other fish oils. In fact, hardly a tenth, it is believed, of what is sold under that name, is genuine, being either refined whale or sea elephant oil.

Copaiba is an article which is likewise much adulterated; generally, by mixing it in various proportions with Venice turpentine, oil of turpentine, or flax-seed oil mixed with a portion of oil of turpentine. It is surprising that an article so cheap, and when the fraud can be so readily detected by merely solidifying the copaiba in the compound, should be adulterated; but there is no doubt of the fact.

Cantharides, in *powder*, are frequently adulterated with some of our native beetles; but, in other instances, with inert substances, with the addition of black pepper and euphorbium, to give activity.

Musk is rarely sold entirely genuine. That which is generally vended under this name is a mixture, in variable proportions, of dried blood with catechu, and even chocolate, scented with a little pure musk. Of course, such a preparation is quite inert.

Bitartrate of potassa, besides the tartrate of lime which it is naturally associated with in variable proportions, is adulterated by the admixture of sulphate of lime, alum, and wheat flour; and in this state it is sold extensively by grocers in the Eastern cities to bakers, to mix with bread.

Nitrate of potassa is adulterated with crystallized Turks Island salt. A provision merchant in Baltimore mentioned to a member of the committee that he found it required one-third more of what he purchased in that place, to colour his pork, than of some which he procured from London. The difference he ascribed to the common salt mixed with it.

Spirit of nitric ether, as already remarked, is adulterated with alcohol and water, and frequently with water alone, and may be purchased at any price above that of water itself. In some places, the officinal, or "*first quality*," as it is called, is never dispensed except when specially called for, not even in prescriptions.

Iodine.—This being in great demand from its use in the arts as well as in medicine, and withal an expensive article, is very com-

monly adulterated. The substances most employed for the purpose are plumbago, charcoal, and oxide of manganese. An excess of water, too, amounting sometimes to fifteen or twenty per cent., is often met with, and is, doubtless, purposely added to increase its weight, especially when charcoal is present. For manufacturing objects, these impurities are of little moment, as the chemists who buy it are good judges, and know how to regulate both their purchases and their processes to meet the case; but for medicinal purposes, it is of more consequence; and hence, before using it, it should always be resublimed to free it from impurities.

The *salts of iodine* are frequently imperfect from bad manufacture; but it is presumed they are seldom adulterated, except the *iodide of potassium*, in regard to which there is more fraud at the present time than almost any other article. From its general employment for all the objects for which iodine is administered, and its extensive demand in the arts, it has become an article of great request; hence, and from the facility with which it is adulterated, its purity cannot be depended on, unless procured from some of our best manufacturing chemists, or druggists who obtain it directly from them. The best specimens generally contain from five to ten per cent. of carbonate of potassa, particularly if much care is not taken in its manufacture; and in this proportion its crystalline character is not affected. But frequently the proportion is so great as to render it certain that fraud is intended. Dr. Christison says he has "sometimes found 74.5 per cent. of carbonate and 16 of water along with it, so that there was only 9.5 per cent. of pure salt." It is sometimes adulterated too with nitrate of potassa, and the chlorides of potassium and sodium.

Great frauds are perpetrated in the *preparations of mercury*.

Blue pill, which should contain *one-third mercury*, is openly sold by wholesale druggists having only *one-fourth*; and in some instances it scarcely contains any mercury at all, its place being supplied by various foreign matters, as plumbago, animal charcoal, &c.; and the same remarks apply to mercurial ointment.

Red oxide of mercury is frequently adulterated with *red oxide of lead*, in large proportion; *ammoniated mercury*, or white precipitate, with carbonate of lead and sulphate of lime.

Calomel is reported by some of the physicians in the Western States to be adulterated with corrosive sublimate; when this happens, it is owing to its not having been well washed, which, it is presumed, is seldom the case. The manufacture of it in all its details is so

well understood, and the tests of its purity are so simple and certain, that the most inexcusable carelessness must exist where it is sent forth contaminated in this way. It is also said to be sometimes adulterated with the subnitrate of bismuth. Generally, however, the calomel of commerce is admitted to be good.

Hydrargyrum cum cretâ.—This preparation, made in the ordinary way by simple trituration, has always been regarded as a very certain and mild medicine, and especially adapted to irritable conditions of the stomach and bowels, as in the summer complaints of children. The process for making it being a tedious one, especially when performed by the hand, many experiments have been tried to facilitate the extinguishment of the globules of the metal without altering the character of the preparation. By Dr. Stewart, of Baltimore, it was proposed, a few years ago, to accomplish this by triturating the mercury first with resin, and then with the chalk, by which means considerable time and labour are saved. The resin is removed, when the trituration is completed by washing the powder with alcohol. This process, having received the sanction of some of our best pharmaceutic chemists, has been practised to a considerable extent, without any suspicion, until lately, that an important change occurs in the character of the preparation, and one liable to produce the most serious consequences. In the *American Journal of Pharmacy* for April, 1850, there is an interesting article on this subject by Professor Procter, of the Philadelphia College of Pharmacy, from which we derive the following information:—

Mr. Procter, having observed a reddish tinge in a portion of the hyd. cum cretâ, prepared by this process, about a year and a half previously, was struck with the departure of the medicine from the usually bluish colour; and, recollecting that several instances had occurred, within a few years back, in Philadelphia and Baltimore, of unlooked-for effects following its exhibition, it occurred to him that “some unknown circumstances had caused the peroxidation of the mercury.” To determine this point, he subjected the preparation to analysis, with the following results:—

	Per cent.	
Deutoxide of mercury,	22.80	equal to 21.25 of metal.
Protoxide of mercury,	4.21	4.05
Metallic mercury,	10.83	10.83

Mr. Procter, with such evidence before his eyes, very properly rejects the process of Dr. Stewart, and suggests the inquiry, whether

a similar change may not, although more gradually, take place in the preparation made in the ordinary way. So large a percentage of deutoxide as 22.80 very well accounts for the severe effects which have been found, in some instances, to follow the exhibition of this article, and it is worthy of attention to discover whether any such change occurs in that made by the common process. If it shall be found that it takes place ever so gradually or slowly, that mode of preparing mercury must be abandoned entirely, or it must be done in small quantities and at short periods.

In the blue mass, which is an analogous preparation, the saccharine matter, it is presumable, exercises a preservative influence over the preparation.

Opium.—Large quantities of inferior and adulterated opium have been excluded from our market, as already mentioned, by the operation of the present law of Congress, which would otherwise have been imposed upon us; but in place of it, adulterations to some extent have been noticed in morphia and its salts. It is not improbable, however, that these are attributable to want of care in their preparation.

The *valerianates*, of late years, have been the subjects of considerable attention, and, being highly expensive, they have also become objects of adulteration. It is asserted, by good authority, that the articles of this class generally sold in the shops consist merely of the bases, scented with a little of the oil of valerian.

It has always been remarked that the most costly medicines, and those in great demand, are the most commonly adulterated. *Sulphate of quinia* comes under both these heads, and accordingly complaints are made continually, especially in the South and West, where it is most required, of its inefficiency and uncertainty of effect. There can be no doubt that the fault is generally attributable to its adulteration. Various articles are employed for this purpose. Sometimes the less costly alkaloids, as salicine; but most generally mannite, from its cheapness, and the strong resemblance it bears to the beautiful, needle-like crystals of the sulphate. Very recently, a large drug-house in Boston, of unsullied character, sold five hundred ounces, to be sent to California, and, after it had been shipped, it was ascertained that it was adulterated with twenty-five per cent. of mannite. The article bore the label of a distinguished French chemist, and is believed to have been pure when imported, but, in its progress through New York, it is supposed to have *imbibed* the mannite by a kind of *endosmose*! That there is *exosmose* in these cases is pretty evident, for the quantity is

always increased, as must be inferred from the price growing less! Thus, sulphate of quinia sells at a price varying from four dollars an ounce, at which it is sold by the manufacturers, to two dollars. At the latter rate, it can be purchased of peddlers, small retailers, and a certain class of large drug-dealers; and this never could be afforded, if it were not for this remarkable property of attracting foreign substances. It may be well to mention that the best yellow bark employed for the manufacture of the article sells in large quantities at a dollar and fifty cents, and upwards, the pound, and that, by the best ascertained process, it requires two pounds, at the least, to obtain an ounce of the salt. With a knowledge of these facts, can there be any mystery in the accounts we frequently hear of enormous doses being given with impunity?

Extensive inquiries among physicians, manufacturing chemists, and druggists have led to the following conclusions:—

1st. That the wholesale druggists in the large cities, equally in the South and West as in the Eastern States, who are not specially engaged in selling nostrums, either as proprietors or agents, conduct their business on fair and honourable principles. As a general rule, they buy their choice chemicals from those who manufacture them, and either import other articles, or get them directly from those who do, and are always disposed to supply good articles to customers who are willing to pay a remunerating price. At the same time, many of this class keep inferior articles, which they dispose of for a corresponding price to physicians and storekeepers who insist on buying at reduced rates.

2d. That the inferior and adulterated drugs are chiefly disposed of in the southern and western portions of the United States—to the physicians and people residing in the small towns and villages, and sparsely populated districts. That in the large cities, particularly in the Atlantic States, bad drugs are, as a very general rule, dispensed only by inferior apothecaries.

There is ground to hope that we shall hereafter be protected from the introduction of spurious drugs from abroad; and, if effectual means can be devised to prevent their sophistication and sale at home, a great boon will be conferred on the community. It is not probable that this can be fully accomplished; but the evil may certainly be very much limited. How shall this be done? Various plans have been suggested, of which the following may be considered as the most important:—

1st. To apply to the State legislatures to pass laws authorizing the

appointment of inspectors, and making it a penal offence to deal in adulterated drugs and medicines.

It is difficult to understand why fraud in the manufacture and sale of medicines, which have so important an influence on the health and lives of the people, should not be punished with the same severity as debasing and counterfeiting money, which merely affects their pecuniary interests. The past history of State legislation, in relation to the practice of medicine, affords little hope, however, that any salutary laws on this subject can be procured in many or all of the States of the Union; and without a general concurrence of action, no good will be accomplished. It is to the members of our own profession, therefore, in conjunction with the respectable druggists and apothecaries, that we must look for whatever reformation is to be accomplished.

2dly. It has been suggested that physicians should feel it to be their duty to inspect the medicines in the drug stores from which they are in the habit of obtaining supplies for themselves or their patients. This would exercise a wholesome influence, if submitted to by the apothecary, and frequently performed by the physician, neither of which, however, is very probable. A more effectual plan, because of its being more likely to be carried out, would be for the various State medical societies annually to appoint a board of examiners, who should procure samples of different articles from the drug stores within their limits, analyze and otherwise examine them, and publish the results. If this were impartially and skilfully done, it would excite the ambition of the meritorious and control the less scrupulous.

Properly to carry out this plan, as well as for their own security in making purchases, physicians should become better acquainted with the physical characters of drugs, and be able, with the assistance of a good treatise on chemistry, to analyze the various chemical articles recognized in the Pharmacopœia. The requisite apparatus for this purpose, which need not be costly, should be in every physician's office, and good specimens of the various articles of the materia medica, with samples of the inferior or adulterated. This is especially desirable in offices into which students of medicine are received.

3dly. The co-operation of the druggists and apothecaries in discouraging and putting down the traffic in inferior and adulterated medicines should be solicited. For this purpose, they should be encouraged to institute pharmaceutical associations in every con-

siderable town throughout the country, which, more than anything else, would tend to elevate the professional and moral standing of their craft. Men who are in the habit of meeting together for laudable purposes are far less liable to plunge into bad practices than the isolated being whose better feelings are not warmed by association. The establishment of such societies has always been salutary. In Philadelphia, the institution of the College of Pharmacy, with its cabinets, its lectures, and excellent quarterly Journal, which is published regularly, has raised the character of the apothecaries to an enviable height; and in the city of New York, where a like organization has been more recently formed, similar effects are observable.

4thly. In making their purchases of medicines, physicians should be willing to pay fair prices, and be careful to procure them only from the most respectable druggists. Men of this character, selling in large quantities, never demand exorbitant profits, and it is not to be expected that they will sell good articles at a loss.

A large amount of the inferior qualities of drugs passes through the hands of country storekeepers, who deal in dry goods, groceries, hardware, &c. With people who are such indifferent judges, articles are selected that afford the largest profits, and the quality is pretty certain not to exceed the price.

A class, worse even than this, of whom to purchase medicines, are druggists whose advertisements are chiefly filled with nostrums and secret preparations. They who deal with men of this description, besides exposing themselves to the risk, amounting almost to certainty, of being cheated, may be regarded as active supporters of the worst kinds of quackery.

In conclusion, the committee beg leave to offer the following Resolutions for the consideration of the Association:—

1st. *Resolved*, That the various State and local medical societies be requested annually to appoint boards of examiners, whose duty it shall be to procure specimens of drugs from the stores within their limits, for examination, and report upon the same to their respective societies, at least once in every year.

2dly. *Resolved*, That the respectable druggists and apothecaries throughout the United States be requested to take active measures for suppressing the fabrication and sale of inferior and adulterated drugs, and that it be respectfully suggested to them, whenever practicable, to form themselves into societies or colleges for the promotion of pharmaceutical knowledge and general improvement in their profession.

3dly. *Resolved*, That a committee be appointed, consisting of one member from each State here represented, whose duty it shall be to collect information in regard to adulterated and spurious drugs, and report the same at the next meeting of the Association.

R. M. HUSTON, *Chairman.*

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