

Original Articles.

MODERN LEGISLATION RELATIVE TO ADULTERATION OF FOOD AND DRUGS.

BY SAMUEL W. ABBOTT, M. D.,

Health Officer of Massachusetts Board of Health, Lunacy, and Charity.

HOWEVER appropriate the customary historical review of a subject may be in an elaborate treatise, I shall devote but a brief portion of this paper to the discussion of the ancient practices relating to food and drug adulteration. The usual history of petty crimes, traced back through centuries to the classic days of Greece and Rome, is repeated in the matter of adulteration. Pliny and Vitruvius and others tell us that opium was adulterated with the juice of other plants, and tests were prescribed for the detection of the fraud. Bread was adulterated with white earth obtained near Naples, and frauds in the making of wine were so common at Athens as to require the appointment of inspectors to prevent and expose the practice.

The disposition of many of the human race to cheat their neighbors has proved to be the mainspring of a continuous and an increasing industry from the earliest times up to the present. Just so long as avarice shall continue to be a ruling passion among men so long will legislation be needed to prevent adulteration, sophistication, and other forms of debasement.

The first English law on record relative to adulteration was enacted in the eleventh century, in the reign of Henry III. By the provisions of this law the pillory and the tumbrel¹ were prescribed for the punishment of dishonest bakers, brewers, and others.

Dr. Blyth quotes the following quaint passage from an old paper entitled *A Quip for an Upstart Courtier*:—

"For you, Goodman baker, you that love to be seen in the open market-place, upon the pillory, the world cries out on your wiliness. You buy your corne at the best hand, and yet will not be content to make your bread weight by many ounces. You put in yeaste and salt to make it heavie, and yet all your policie cannot make it. The poor crie out, the rich find fault, and the lord maior, and the sheriffs, like honourable and worshipful maiestrates, every daie walk abroad and weigh your bread and yet all will not serve to make you honest men. But, were extremities used and the Statutes put in the highest degree in practice, you would have as few eares on your head as the collyer."

An ordinance of 1316 prescribed that "no one shall mix any manner of wares, that is to say, shall put old things with new, or new things with old, by reason whereof the good thing may be impaired by the old, nor yet things of one price, or of one sort, with other things of another sort. . . . Also that no man shall moisten any manner of merchandise such as saffron, ginger, alum, cloves, and such manner of things as admit of being moistened."

During the following three centuries groceries and drugs were sold in the same shop, the two trades being combined until 1617, when the apothecaries formed a separate body, and have since remained a distinct trade or occupation.

In France similar laws were in force from early periods relative to bread, wine, and other articles of food. As long ago as 1396 an ordinance was in force

in Paris forbidding the coloring of butter with herbs, flowers, or drugs.

The sophistication of drugs was forbidden, and apothecaries also were forbidden to use exhausted drugs under a heavy penalty. Adulterated articles were to be seized and burned in front of the house where they were found.

In Germany likewise for several centuries severe penalties have been inflicted for the sale of adulterated bread, wine, and drugs. For the former a similar penalty was inflicted to that employed in England. The offender was put in a basket at the end of a long pole and plunged in a muddy pool.

MODERN ENGLISH LEGISLATION.

A select parliamentary committee on the adulteration of food was appointed in 1855, and began its labors by a careful investigation of the whole subject, many persons being summoned before the committee who were supposed to possess special information as to the various forms of adulteration which were common at that time. Dr. Hassall, whose careful work had formed a fitting prelude to this inquiry, contributed much valuable information. On the report of the commission the first general Adulteration Act was drafted, and became a law in 1860. By this act it was provided "that every person who shall sell any article of food or drink, with which, to the knowledge of such person, any ingredient, or material injurious to the health of persons eating or drinking such article, has been mixed, and every person who shall sell as pure or unadulterated, any article of food or drink which is adulterated or not pure, shall, for every such offense, on summary conviction of the same, pay a penalty not exceeding £5. with costs."²

A second offense was punishable by publishing the offender's name, place of abode, and offense, in addition to the fine.

The analysts under this act were at first appointed by the secretary of state, and afterward by the local government board.

In 1872 the act was remodeled, and other provisions were substituted, especially relating to willful adulteration and criminal intent.

These acts were crude, and during the fourteen years of their operation much dissatisfaction was expressed at the want of standards of common articles of food, at the disagreement of analysts, and at the conflicting decisions of magistrates as to the exact meaning of the term *adulteration* and other legal technicalities.

A new committee was therefore appointed in 1874, witnesses were again examined, greater care being taken to summon merchants, manufacturers, milk dealers, and other persons specially interested in the operation of the act. This committee recommended certain important amendments, and summed up the inquiry by stating that the public was "cheated" rather than "poisoned."

As the result of this inquiry other statutes were enacted in 1875, 1878, and 1879, these constituting the acts now in force in England. As these acts are lengthy the chief points of interest need only be referred to at this time.

The first two sections repeal all previous legislation upon the subject, and define certain terms employed in

² Blyth. *Foods, their Composition and Analysis*, London, 1882.

¹ Ducking-stool.

the act. All offenses under the act are then specified. Ten sections provide for the appointment of analysts, and define their duties. Eight sections prescribe the modes of procedure against offenders. Section 29 provides for the expenses of executing the act. Sections 30 and 31 relate to the special inspection and analysis of tea. Sections 33 and 34 provide for the application of the law in Scotland and Ireland.

The amendment of 1879 provided in addition that it should not be alleged in defense that the purchaser, having bought only for analysis, was not prejudiced by the sale. Other amendments of minor importance were made in the same year.

As a result of these acts there were examined in England, in 1881 and 1882, 32,708 samples specified as follows:¹—

Year	Milk.		Butter.		Groceries.		Drugs.		Wines, Spirits, and Beer.		Bread and Flour.		Waters.		Sundries.		Totals.	
	No. Analyzed.	No. Adulterated.	No. Analyzed.	No. Adulterated.	No. Analyzed.	No. Adulterated.	No. Analyzed.	No. Adulterated.	No. Analyzed.	No. Adulterated.	No. Analyzed.	No. Adulterated.	No. Analyzed.	No. Adulterated.	No. Analyzed.	No. Adulterated.	No. Analyzed.	No. Adulterated.
1881	6821	1361	1081	187	4328	420	487	93	1967	471	1134	48	1463	838	580	29	17,808	2960
1882	5518	1123	945	144	3626	399	328	55	2151	454	1017	44	689	195	626	44	14,900	2458
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	32,708	5418

In France a new impetus has been given to the work of food inspection by the establishment in all the important cities of municipal laboratories and the appointment of inspectors, who, in accordance with the statutes, have power to punish offenders against the laws. Laboratories have been established in Paris, Lyons, Marseilles, Bordeaux, and other large cities. The officials appointed for each are a director, inspectors, and chemists.

Samples are obtained at the markets and shops by the inspectors, in which duty they are assisted by the commissaires de police. They go in pairs to such places as are indicated by dissatisfied purchasers, and, where it is practicable, make cursory examinations at the place of sale. If adulteration is detected two samples are taken, sealed, numbered, and certified by them and also by the tradesman. One is taken to the laboratory, and the other reserved in case of a dispute. Special notice is taken of the condition of the establishment or place of sale as to cleanliness, etc.

The public are invited by notification to take advantage of the statutes, and to request analyses as often as they shall choose to exercise the privilege. Qualitative analyses are made gratuitously, and quantitative analyses are paid for by a fee of five to thirty francs, according to the cost. Statements relative to qualitative analyses are confined to the terms *good*, *passable*, *bad* (not injurious), and *bad* (injurious).

Quantitative analyses must define the exact composition of the article in question.

The laboratory receives two classes of samples, those contributed by the public and those received from the inspectors, while many samples are also analyzed which are obtained from the hospitals, prisons, and other public institutions. From the results of the laboratory work reports are sent to the public prosecutor, who institutes proceedings against offenders.

Much care is given to the work of ascertaining the normal composition of the different articles of food.

The laboratory is amply provided, and has a special photographic department for the purpose of showing

clearly to a judge or a jury the palpable proof of adulteration, as in the case of spices, cereals, trichinæ, and other objects requiring ocular demonstration.²

The following table³ shows the work of the laboratory for 1881:—

Total number of samples examined	6517
Percentage of adulteration, total of all samples	50.43
Percentage of adulteration, milk	50.67
Percentage of adulteration, wine	59.17

The samples were also classified as follows:—

Good	1565
Passable	1523
Bad (not injurious)	2608
Bad (injurious)	562
	6258

The remainder (259) were in process of examination at the time of the report.

The samples included, besides wines and milk, spirits, syrups, waters, butter, bread, chocolate, preserves, coffees, confectionery, spices, toys, and various other articles.

The German statutes regulating the sale of food and of drugs are at present not like our own, combined in one statute, but are entirely distinct. The principal law relating to the supervision of the sale of drugs bearing date March, 1872, and the latter, the food law, being enacted May 25, 1879. The drug law of 1872 regulates the sale of medicines, and establishes the German Pharmacopœia as the standard in place of those in use before the union and consolidation of the Empire. The food law regulates the sale of food and drink, dyes, carpets, toys, cooking utensils, and petroleum. Careful attention has been bestowed upon the subject in Germany. In 1878 231,478 samples of different articles were analyzed, and upon the evidence of these analyses 3352 convictions were obtained.

Switzerland also has stringent laws for the prevention of adulteration, especially in the Canton of Zurich.

¹ The Analyst, vols. vi. and vii.

² Analyst, vol. vii.

³ Documents sur les Falsifications des Matieres Alimentaires. Paris. 1882.

Canada has made commendable progress in the same direction, as shown by the reports issued annually since 1876 by the Inland Revenue Department. A summary of the work there accomplished for the six years beginning in 1876 is as follows:¹ —

No. of Anal-yses.	Genuine.	Adulter-ated.	Doubtful.	Total.	Per Cent. Adulter-ated.
1876	87	93	—	180	51.66
1877	241	247	—	488	50.61
1878	523	271	19	813	33.33
1879	619	235	42	896	26.22
1880	728	295	20	1043	28.28
1881	749	260	38	1041	24.97

UNITED STATES.

The thorough investigations of the Parliamentary Committee, and the subsequent legislation in England, were soon followed by similar inquiry in the United States.

Special work had already been accomplished by State Boards of Health, notably those of Massachusetts and Michigan, in the examination of food, during the past ten or fifteen years.

It needs but a passing reference that volumes of sensational and exaggerated statements have been written upon this subject. Column after column of wild assertions as to special articles of food have appeared in the public prints, until the timid consumer is almost driven to starvation as a last resort.

The first movement in the United States toward general legislation for the prevention of this existing evil was initiated by the National Board of Trade in 1879.

DRUG INSPECTION.

It should be said, however, in relation to the department of drug inspection, that valuable work had already been accomplished by the formation of the American Pharmaceutical Association, which for many years exerted a powerful influence in the direction of a pure supply of drugs.

A law had already been enacted by Congress in 1848, providing for special examiners of drugs at important sea-ports. At one port alone (New York) the examiner rejected in nine years 900,000 pounds of adulterated drugs. Political influence interfered very much with the efficiency of this law, and at some ports rendered it inoperative. The amount of adulteration of drugs previous to the enactment of the law referred to was very great. On the authority of Dr. Bailey, the United States drug inspector for the port of New York from 1848 to 1857, nearly one half of the drugs imported were adulterated. Establishments existed in England, Germany, Belgium, and France, where drugs were "prepared with special reference to their sale in the United States." The existence of establishments in this country where adulterations have been systematically practiced has also been demonstrated, especially with reference to powdered drugs.²

Reasons for the existence of such practice are by no means wanting. Many dealers enter upon their busi-

ness with the sole idea of profit. Competition naturally follows until profit is no longer possible. As a further consequence adulteration and the sale of inferior substitutions follow. The manufacturer is sought who sells at the lowest price without regard to quality.

The actual effect of such practice on the health of the people is plainly stated in a recent report to the National Board of Health by Prof. C. L. Diehl, of Louisville, Ky., who says: "One need not be a physician to appreciate the fact that satisfactory medication is impossible when the medicine administered is not that designed by the prescriber. It is not sufficient that the medicine should be '*very nearly*' that which is designed; it should '*absolutely*' correspond to the standard, which the physician has before his mind at the time when he finds it necessary to prescribe it. It is therefore the duty of the dispenser to see to it that the medicines he dispenses conform in every respect to the standard that has been framed for his guidance as well as for the guidance of the physician. The fulfillment of these conditions depends not alone on the integrity of the dispenser, it depends equally on his knowledge and skill; and unless these are combined with integrity the prescriber cannot hope for results which the nature of the disease may justify him to expect. Finding that the medicine has not the expected effect, the prescriber may be led to increase the dose or to replace that originally prescribed by another, without, however, ameliorating the disease or causing it to yield to his treatment. He now perchance begins to suspect that the medicine supplied is not as it should be, and changing his apothecary, soon cures his patient.

"If all cases of bad medication were as simple in their development as the one illustrated there would perhaps be no necessity for this report. Unfortunately, however, such is not the case. It quite often happens that, the diagnosis being well established, it is urgent that the proper medicine should be properly administered. If in a case of this nature the medicine should happen to be of indifferent or inferior quality the life of the patient is placed in jeopardy, and under some circumstances sacrificed. Again, the prescriber, conforming the medication to his diagnosis, may be led to reject that originally made, because he fails to obtain the effect which an abundant experience justifies him to expect from the drug administered. In a case of this kind he may for a time be completely at fault, while the illness of his patient is vexatiously prolonged, or, it may be, aggravated. In short, the use of inferior and adulterated medicines may be the cause of protracted disease, of increased suffering, and in some instances of death; and failing to mitigate and cure diseases in which pure medicine is unequivocally indicated they may lead the physician to errors in diagnosis, cause him to acquire the habit of prescribing large doses of active medicines, and, in fact, seriously affect his success and reputation."

Let me not be understood in this connection as considering drugs to be the *sine qua non* of therapeutics. The physician who uses them to the exclusion of such important remedial measures as heat and cold, light, fresh air, electricity, massage, diet, etc., has hardly learned the alphabet of practice. But if we must use drugs at all, and especially such important remedies as

¹ Inland Revenue Report. Ottawa. 1881.

² Prof. S. P. Sharples, Supplement to Fourth Annual Report State Board of Health, Lunacy, and Charity.

³ Sixth Supplement to National Board of Health Bulletin, 1880, article by Prof. C. L. Diehl.

opium, and quinine, and ether, and alcohol, let us be assured that they are of a definite strength, and when the physician prescribes a gramme of quinine or twenty-five drops of laudanum let him know that the pills for which he writes, on the one hand, contain just the amount of the alkaloid prescribed, and that the laudanum also has been made from opium of a standard strength, and not from a cheap or exhausted article.

Special laws relating to certain articles of food and drink have existed in this State for many years. Fish, meat, milk, cocoa, vinegar, butter, and cheese have all been the objects of legislation, and provision has been made for their inspection by local officers. But in later years the need of a general, comprehensive law, which should include everything used as food, or drink, or medicine under one statute, has been urged as a necessity both of national and of State legislation.

The inquiry of the National Board of Trade, inaugurated in 1879, resulted in the recommendation of a law, which, with but few modifications, has been adopted in the States of New York, Michigan, Massachusetts, and New Jersey. This law was enacted in our own State in May, 1882, and took effect in the following August. The law as then enacted is as follows:—

[CHAP. 263.]

An Act relating to the Adulteration of Food and Drugs.

Be it enacted, etc., as follows:

SECT. 1. No person shall, within this Commonwealth, manufacture for sale, offer for sale or sell any drug or article of food which is adulterated within the meaning of this act.

SECT. 2. The term "drug" as used in this act shall include all medicines for internal or external use, antiseptics, disinfectants and cosmetics. The term "food" as used herein shall include all articles used for food or drink by man.

SECT. 3. An article shall be deemed to be adulterated within the meaning of this act, —

(a.) In the case of drugs, — (1.) If, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality or purity laid down therein; (2.) If, when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other pharmacopœia, or other standard work on *materia medica*, it differs materially from the standard of strength, quality or purity laid down in such work; (3.) If its strength or purity falls below the professed standard under which it is sold:

(b.) In the case of food, — (1.) If any substance or substances have been mixed with it so as to reduce, or lower, or injuriously affect its quality or strength; (2.) If any inferior or cheaper substance or substances have been substituted wholly or in part for it; (3.) If any valuable constituent has been wholly or in part abstracted from it; (4.) If it is an imitation of, or is sold under the name of, another article; (5.) If it consists wholly or in part of a diseased, decomposed, putrid or rotten animal or vegetable substance, whether manufactured or not; or, in the case of milk, if it is the produce of a diseased animal; (6.) If it is colored, coated, polished or powdered, whereby damage is concealed, or if it is made to appear better or of greater value than it really is; (7.) If it contains any added poisonous ingredient, or any ingredient which may render it injurious to the health of a person consuming it.

The State Board of Health, Lunacy, and Charity may from time to time declare certain articles or preparations to be exempt from the provisions of this act; and the provisions hereof shall not apply to mixtures or compounds recognized as ordinary articles of food, provided that the same are not injurious to health, and are distinctly labeled as mixtures or compounds.

SECT. 4. The State Board of Health, Lunacy, and Charity shall prepare and publish from time to time lists of the articles, mixtures or compounds declared to be exempt from the provisions of this act, in accordance with the preceding section. The said board shall also from time to time fix the limits of variability permissible in any article of food, or any drug, or compound, the standard of which is not established by any national pharmacopœia.

SECT. 5. The State Board of Health, Lunacy, and Charity shall take cognizance of the interests of the public health relating to the sale of drugs and food and the adulteration of the same, and shall make all necessary investigations and inquiries

in reference thereto, and for these purposes may appoint inspectors, analysts and chemists, who shall be subject to its supervision and removal.

Within thirty days after the passage of this act the said board shall adopt such measures as it may deem necessary to facilitate the enforcement hereof, and shall prepare rules and regulations with regard to the proper methods of collecting and examining drugs and articles of food. Said board may expend annually an amount not exceeding three thousand dollars for the purpose of carrying out the provisions of this act.

SECT. 6. Every person offering or exposing for sale, or delivering to a purchaser, any drug or article of food included in the provisions of this act, shall furnish to any analyst or other officer or agent appointed hereunder, who shall apply to him for the purpose and shall tender him the value of the same, a sample sufficient for the purpose of the analysis of any such drug or article of food which is in his possession.

SECT. 7. Whoever hinders, obstructs, or in any way interferes with any inspector, analyst, or other officer, appointed hereunder in the performance of his duty, and whoever violates any of the provisions of this act, shall be punished by a fine not exceeding fifty dollars, for the first offense, and not exceeding one hundred dollars for each subsequent offense.

SECT. 8. This act shall take effect at the expiration of ninety days after its passage. (Approved May 26, 1882.)

This law has certain points in common with that now in force in England, and also some notable points of difference.

Each law distinctly defines certain terms which are used therein. This feature of the law has the obvious advantage of saving an endless discussion in the courts upon the meaning of terms in the statute. The words *drug* and *food* are clearly defined in each law, and in the Massachusetts law (or rather the United States) the definition of *adulteration* is also stated with unusual clearness and precision.

In the case of drugs, the terms *differ* and *differ materially* are employed, the former relating to official preparations of the United States Pharmacopœia and the latter to others not official. The former is plainly a more stringent provision than the latter, and justly so, since the official preparations are the most commonly used and are by far the most important. Useful preparations when discovered, or proposed, are usually admitted to the Pharmacopœia at each decennial revision of the work. It would seem that a manual compiled with and by the consent of a commission of representative physicians and druggists from the entire country should be admitted as undoubted authority.

In the case of food the various modes of adulteration or debasement are carefully stated. Either one or several of these may exist in a given sample or article, as in the case of milk, in which either the first, third, fourth, fifth, sixth, seventh, or all of them may exist at the same time.

Certain exceptions are made in the British law:—

(1.) In the case of ingredients not injurious to health, added to render an article fit for carriage or preservation, and not to fraudulently increase its bulk, weight, or measure, or to conceal its inferior quality.

(2.) In case of patent medicines.

(3.) Where a drug is unavoidably mixed with some extraneous matter in the process of preparation or of collection.

Another clause provides that compound foods or drugs must be in accordance with the demands of the purchaser, with reference to the ingredients contained.

A legible descriptive notice or label attached to an article, stating that it is mixed, exonerates the seller.

The British law also provides that a buyer who purchases with intent to submit an article for analysis must notify the seller of such intention, and offer to divide the article into three parts, each part to be

sealed, and one part delivered to the seller, one part he retains, and the third is submitted to the analyst. If the seller does not accept the offer of the buyer to divide the article, the analyst on receiving it divides it into two parts, one of which he delivers to the purchaser to be reserved by him in case of prosecution.

The French Code also provides for a division of each article purchased into two portions.

In addition to the general law passed by the Legislature of Massachusetts in 1882 an amendment was enacted in the following year providing that the State Board should make prosecutions of offenders, and that a definite portion (two fifths) of the appropriation should be expended in the enforcement of the laws for preventing milk adulteration.

With these two laws upon the statute books we may now inquire what has been accomplished towards an improvement of the food and drug supply in Massachusetts, though such an inquiry may be deemed somewhat premature since less than eight months have elapsed since the enactment of the amendment of the statute.

In compliance with the law, two analysts were appointed soon after the date at which it took effect, and after the passage of the amendment the number of analysts was increased to four, two of whom were appointed for the sole purpose of milk analysis.

The period between the passage of the law of 1882 and the amendment of 1883 was chiefly occupied in the inspection and analysis of samples with reference to ascertaining the actual condition of the supply of the State. Samples have been collected in all parts of the State, chiefly in the cities and large towns.

The whole number analyzed has been about 1400. This number includes over 300 samples of milk.

The percentage of adulteration among drugs has been found to be forty per cent.

Among articles of food forty-seven per cent. were found adulterated within the meaning of the statute.

Of milk seventy-eight per cent. were found adulterated within the meaning of the statute.

Seventeen prosecutions have been entered in the courts on complaint of the Board, one of which was withdrawn in consequence of the death of the defendant. In all the other cases adulteration was satisfactorily proved, but in two of them the defendant escaped conviction in consequence of minor technicalities, while the remaining fourteen were convicted.

As a salutary result of the work thus far accomplished druggists have been stimulated to use greater care in the selection, the purchase, and the manufacture of pharmaceutical preparations. Grocers have appealed to their manufacturers to furnish a better and a purer supply, and milkmen have been taught a useful lesson. We do not pretend to say that Boston has yet a pure milk supply, but we do know that in many cases where we have made repeated analyses from the same establishments there has been a marked improvement.

Within the past six months, or since the prosecutions made by the Board, assayed drugs of definite known strength have become a recognized department of trade. Manufacturers doing business outside of the State have sent to their agents in Massachusetts requesting the return of all preparations which did not conform to the pharmacopœial standard. Wholesale dealers have employed chemists to examine their goods in order to insure a pure stock, and one which

should conform as far as possible to recognized standards.

We venture the assertion that the amount of chemical analysis and assay has been far greater in Massachusetts during the past year than ever before, without reference to the official work of the Board.

Certain objections, amendments, and substitutes have been presented to the Act of 1882. These may be enumerated as

(1.) Local Inspection. While, on the one hand, this mode of operation may have certain theoretical advantages, such as a distribution of the work of supervision and a greater convenience to sparsely-settled districts, on the other hand the practical operation of local inspection in Massachusetts has been a failure for many years past. The reasons may be stated briefly: the petty influence of local politics, frequent changes in office, inadequate compensation, and incompetency. Nothing illustrates this better than the habitual use of the lactometer by milk inspectors to the exclusion of thorough chemical analysis. The fallacy of this instrument is so well known that further reference to it is unnecessary.

(2.) Proof of criminal intent on the part of the seller. The insertion of this provision in the present law is all that is desired by the men who sell water in place of milk, or gypsum for cream of tartar, or inferior grades of drugs for those of standard strength. Such a provision would render the law practically inoperative.

(3.) The insertion of a limiting word like "essentially" or "materially" after the word "differs" in the first clause relating to drugs. By this amendment a loose construction of the law and a sliding scale would result; drugs could be sold of a quality corresponding to the price paid, and standards would be ignored. The prescriber might find the one-grain, or two- or five-grain quinine pills containing three fourths or one half these quantities. In some of the preparations examined by the analysts of the Board the strength has been found to be less than one third of that required by the statute.

No better amendment has been proposed to the present law than such as shall provide for its more thorough and rigorous enforcement, such, in fact, as shall protect the honest manufacturers and producers, and at the same time give to the people, the consumers, everywhere and at all times, the opportunity to test for themselves, for a reasonable fee, the quality of the goods which they use. Such a result might be secured in Massachusetts by the establishment of a State laboratory, such as has recently been organized in Paris for the same purpose. At such an institution, properly equipped with chemical apparatus for analysis, with microscopes for food and drug examination, with apparatus for photography, and all other departments requisite for food and drug inspection, all the work now done by the analysts could be performed; and, also, any individual desiring a certificate of analysis of an article could have the work done at the mere cost thereof. The number of persons presenting material for analysis is by no means small. Scarcely a day passes in which some one does not bring to the office of the Board a sample of food or of drugs for this purpose. These people represent the consumers and the retailers who cannot know with certainty the character of the goods which they purchase.

A public laboratory might also be used for the anal-

ysis of all the public water supplies of the State, both for the chemical and for the biological work which they might demand, and also for the inspection of the food and drug supplies of all its hospitals, prisons, almshouses, and other public institutions.

GENERAL PARALYSIS OF THE INSANE.¹

BY GEORGE F. JELLY, M. D.

CASE IV. S. S., aged forty, married, admitted November 12, 1870, native of Duxbury, Mass. Grandfather and grandmother insane. Said to have had a sunstroke eighteen years before admission to hospital. Habits said to be good. One year since, after hard work and unusual anxiety, he was dull, sluggish, and inactive; would rise in night and wander about in a bewildered manner. In many things seemed changed. Was indifferent to family. Several attacks of partial insensibility. Frequently tripped in walking. Became unable to attend to business, and was finally excited and bombastic. When first seen at asylum was feeble, dull, and bewildered, and he seemed like a rapid case, but he soon rallied, and became much more active mentally, though extravagant and tremulous in speech. He never had convulsions, and only slight semi-conscious attacks.

After two months he passed into a very comfortable state; he was quiet, his speech and gait scarcely affected, and to his friends he seemed almost well. In four months from his admission he left the asylum. He remained quite comfortable for a long time, but mentally weak. After a few months I lost sight of him, but have no doubt that he died some years since.

CASE V. E. A. L., aged forty-eight, married, cooper, a stout, vigorous, coarse, profane man, who has used tobacco and whiskey to excess. Has worked very hard, and has had much trouble with his wife. Six weeks before admission became irritable in manner, very unreasonable, and neglected his business to make foolish bargains; developed delusions of great wealth, but no tremor of lips and no unsteadiness in walking. Very indignant because brought to the asylum, but soon settled down, and declared he would not leave. Very extravagant, declaring he had bought the Fitchburg railroad, and would build a city at his home next summer which would be a "ripper." He failed quite rapidly, but never had convulsions. After some months he developed the usual paralytic symptoms in speech and walk. Ten months after admission he was transferred to Worcester, and died within two years from the inception of the disease.

The next case, No. 6, differs from those already described on account of the sudden and early death of the patient.

CASE VI. D. P. S., aged thirty-nine, single. Admitted February 16, 1872. Coal salesman; native of New York. Father "monomaniac" on subject of religion. His friends said that he had no excesses, but his subsequent history proved that he was somewhat addicted to wine and women. Had worked very hard, and had been subject to severe mental annoyance. He was a little excited one year since, after which he was somewhat melancholy. Within a few weeks had been extravagant, and inclined to make foolish bar-

gains. On admission to asylum very voluble, somewhat incoherent, very happy and extravagant, and had a decided trip in speech. His talk was as follows: "Sheather, in New York is an old friend of mine. My friend Sheather is worth thirty millions. Ed is worth thirty millions, carried on by importing furs. He lives on Fifth Avenue. I have one hundred and fifty millions under my own control. I am the gayest boy out." Soon became entirely contented. Was continually making money; said he could make more money in the asylum than out in the world. He became more quiet, grew stout, but never gave up any of his extravagant ideas or lost the paralysis of speech or in his walk. Each meal was a feast fit for a king, and his room a palace. Seven months after admission he had his first epileptic convulsion, which was repeated several times during the first day, and for a time he was unable to swallow. For a week he had one or more fits every day, and then rallied, and was somewhat clearer. November 24th, nine months after admission, he was again seized with convulsions, but after three hours seemed pretty well. At nine P. M. he retired, and at ten he was dead.

The autopsy showed no gross changes in brain, except excessive congestion. Other organs normal.

CASE VII. J. W. C., aged forty-eight, married, retired sea captain. Admitted June 27, 1873. Said to have had a sunstroke six years before, and had always been a coarse, licentious man, addicted to excessive use of liquor. His friends say that he has been wrong mentally for two years. For thirteen months before admission to asylum had been a patient at Worcester Lunatic Hospital. Was very violent and homicidal at first. He was taken from Worcester on a writ of habeas corpus, attacked Dr. Fisher in court, was remanded to the hospital, and remained till his admission to the McLean. When he entered the latter institution he was mixed, confused, thick in speech, unsteady in gait, and extravagant, but pretty quiet.

He soon became very restless, and three months after admission had violent epileptic seizures, the convulsions being chiefly confined to left arm and leg, though there was marked twitching of both arms and legs. Following these attacks he never recovered his coherence, his left arm and leg became paralyzed and helpless, and he gradually failed. He became filthy, and with his right hand was very destructive. In this condition he was placed under the care of Dr. Mead, and in a few weeks died. An autopsy was made by Dr. Fisher (of which I have no copy).

By a singular coincidence the wife of this patient developed the most characteristic symptoms of general paralysis. I saw her but once, but the extravagance, tremor, and peculiarity of gait were all present. She was sent to the asylum at Concord, N. H., and Dr. Bancroft afterwards told me that hers was a typical case. She survived her husband less than a year.

CASE VIII. E. B. O., aged fifty-three, married, lawyer. Admitted May 23, 1875. One brother had been insane. He had lived very freely, using a good deal of wine, and had had great business anxiety. His was an entirely characteristic case, with more than usual incoherence and confusion. Paralytic symptoms very marked. He improved and left the asylum in six months, still quite weak, but comparatively clear mentally. He is living, his difficulty in articulation is quite marked, and his gait unsteady. He is always cheerful and exhilarated, but is able to live

¹ Concluded from page 225.