to 5 c.c. of the reagent, this being desirable not because larger amounts of normal urine would cause reduction of the reagent, but because more delicate results are obtained by this procedure, (2) vigorous boiling of the solution after addition of the urine, and then allowing the mixture to cool spontaneously, and (3) if sugar be present, the solution (either before or after cooling) *will be filled from top to bottom with a precipitate*, so that the mixture becomes opaque. Since bulk, and not color, of the precipitate is made the basis of a positive reaction, the test may be carried out as readily in artificial light as in daylight, even when examining for very small quantities of sugar. The solution is not dark-colored like Fehling's fluid, so that the precipitate may readily be observed without waiting for it to settle.

A RAPID METHOD FOR THE QUANTITATIVE DETERMINATION OF SUGAR IN URINE

By modifying the composition of the solution described above, it has been found possible to apply the reagent to the rapid and accurate estimation of sugar in urine. Like the old titration process of Fehling, the method described below is based on the fact that in alkaline solution a given quantity of glucose reduces a definite amount of copper, thus decolorizing a certain amount of the copper solution. In the new method, however, instead of the reduced copper being precipitated as the red suboxide, which of its own color obscures the end-point of the reaction, the copper is precipitated as cuprous sulphocyanate, a snow-white compound, which is rather an aid than a hindrance to accurate observation of the disappearance of the last trace of blue color. The solution for quantitative work has the following composition:

	gm. or c.c.
Copper sulphate (pure crystallized).....	18.0
Sodium carbonate (crystallized)*	200.0
Sodium or potassium citrate	200.0
Potassium sulphocyanate	125.0
Five per cent. potassium ferrocyanid solution.....	5.0
Distilled water to make a total volume of.....	1,000.0

With the aid of heat dissolve the carbonate, citrate and sulphocyanate in enough water to make about 800 c.c. of the mixture, and filter if necessary. Dissolve the copper sulphate separately in about 100 c.c. of water and pour the solution slowly into the other liquid, with constant stirring. Add the ferrocyanid solution, cool and dilute to exactly 1 liter. Of the various constituents, the copper salt only, need be weighed with exactness. Twenty-five c.c. of the reagent are reduced by 50 mg. of glucose.

Sugar estimations are conducted as follows: The urine, 10 c.c. of which should be diluted with water to 100 c.c. (unless the sugar content is believed to be low), is poured into a 50 c.c. burette up to the zero mark. Twenty-five c.c. of the reagent are measured with a pipette into a porcelain evaporation dish (25-30 cm. in diameter), 10 to 20 gm. of crystallized sodium carbonate (or one-half the weight of the anhydrous salt) are added, together with a small quantity of powdered pumice-stone or talcum, and the mixture heated to boiling over a free flame until the carbonate has entirely dissolved. The diluted urine is now run in from the burette, rather rapidly until a chalk-white precipitate forms, and the blue color of the mixture begins to lessen perceptibly, after which the solution from the burette must be run in a few drops at a time, until the disappearance of the last trace of blue color, which marks the end-point. The solution must be kept vigorously boiling throughout the entire titration. If the mixture becomes too concentrated during the process, water may be added from time to time to replace the volume lost by evaporation. The calculation of the percentage of sugar in the original sample of urine is very simple. The 25 c.c.

of copper solution are reduced by exactly 50 mg. of glucose. Therefore the volume run out of the burette to effect the reduction contained 50 mg. of the sugar. When the urine is diluted 1:10, as in the usual titration of diabetic urines, the formula for calculating the per cent. of sugar is the following:

$$\frac{0.050}{X} \times 1,000 = \text{per cent. in original sample, wherein } X \text{ is the number of cubic centimeters of the diluted urine required to reduce 25 c.c. of the copper solution.}$$

In the use of this method chloroform must not be present during the titration. If used as a preservative in the urine it may be removed by boiling a sample for a few minutes, and then diluting to its original volume.

Like the reagent for qualitative employment, the one for quantitative work will keep indefinitely after its preparation. As regards the accuracy of the method, it may be stated that repeated determinations, and comparisons with results by the polariscope and by Allihn's gravimetric process have shown the method to be probably more exact than any other titration method available for sugar work.

437 West Fifty-Ninth Street.

DANGERS OF CERTAIN ETHICAL PROPRIETARY PREPARATIONS TO BOTH PHYSICIANS AND PUBLIC*

M. H. FUSSELL, M.D.
PHILADELPHIA

So much has been written on this subject that a new paper may seem superfluous. The reasons which have impelled this paper are the following:

1. My desk is continually flooded with medicaments sent by manufacturing pharmacists, and delivered by detail men who talk quasi-scientifically, and just as glibly as they did when I began to practice twenty-five years ago.

2. In mingling with other physicians I find many such mixtures and new preparations used in practice, the only excuse being the recommendations contained in literature accompanying the preparations.

3. Many such preparations are used by physicians without any knowledge of their contents or action. There can be no doubt that this use of the preparations is attended by dangers which I hope to make plain.

4. With few exceptions the preparations sent about as samples are mixtures. Now, every intelligent physician knows that if our use of drugs is to be of the least value, each prescription used must apply to the case in hand. It is literally impossible to make a cough mixture, a constipation pill, a remedy for nervousness, and so forth, that will be suitable for all cases. To teach that it is possible to do so, is most pernicious. We may as well—and indeed this often comes to pass under such circumstances—tell our patients they have pneumonia and send them to the druggist for a remedy for pneumonia. These dangers are particularly great to young men just entering the practice of medicine.

Numbers of conditions are necessary for intelligent therapeutics. Among them stand preeminently a careful diagnosis, accurate knowledge of the pathology of the condition under treatment, and an intelligent understanding of the action of the remedy to be used and what we expect to gain by its use. I realize that we

* Read in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixty-Second Annual Session, held at Los Angeles, June, 1911.

Downloaded From: <http://jama.jamanetwork.com/> by a Penn State Milton S Hershey Med Ctr User on 05/24/2015

GERMILETUM.—Alcohol 18 per cent.; Formalin $\frac{3}{4}$ M. per oz. Amylacetate $\frac{1}{4}$ M. per oz. Guaranteed under the Food and Drugs Act, June 30, 1906. Serial No. 299.

GERMILETUM
(Gim)

A perfect Antiseptic Germicide and Deodorant. Slightly Alkaline.

For internal and external use.

UNEXCELLED IN CATARRH AND ECZEMA

Par-Excellent in Obstetrical Practice.

FORMULA.—Borohydrofluoric Acid. Borosalybenzoic Acid, Boroglycerine, Formaldehyde with Menthol, Thymol Amyl Acetate and other Antiseptic Aromatics.

Dios Chemical Co., St. Louis, Mo.

The formula for Germiletum may safely be called a fake.¹ It is almost criminal to call a mixture like this "par-excellent in obstetrical practice." The dangers are great; there is no certainty, judging from the label, that it is the least value as an antiseptic. To depend on such material is to bring a blush of shame to the school from which we graduated. If there is any one condition which demands rigid antiseptics, it is our obstetrical work.

Let us analyze this "par-excellent" remedy. It contains 18 per cent. of alcohol. Alcohol is certainly valueless in this dilution. Formalin $\frac{3}{4}$ M. per ounce. I am uncertain what M. represents, possibly a meter. M. is an abbreviation sometimes used for minim. But judging from the odor entirely, there is about as much formalin in the preparations as there is in spring water.

Amylacetate is not mentioned so far as the writer knows in the eighth revision of the Pharmacopeia, and the National Standard Dispensatory (page 168), says: "It is a good solvent for resins, used as a component of fruit essences and as a solvent of resins in the preparation of lacquers and varnishes."

Neither borohydrofluoric acid nor borosalybenzoic acid is indexed in the "Dispensatory."

I repeat that to use such an article as this is to invite the dangers of inaccuracy and omissions.

SYRUP COCILLANA
COMPOUND

Each fluidounce contains:

Alcohol	5 per cent.
Heroin Hydrochlorid	8-24 grains
Tincture Euphorbiapululifera	120 minims
Syrup wild lettuce	120 minims
Tincture Cocillana	40 minims
Syrup Squill Compound	24 minims
Cascarin (P. D. & Co.)	8 grains
Menthol	6.100 grains

DOSE.—One-half to one fluid-drachm (2 to 4 c.c.).

Guaranteed under the Food and Drugs Act, June 30, 1906.

I have called attention to this preparation before. Is it safe to spread broadcast a preparation that would give $\frac{1}{24}$ gr. of heroin to each full dose? No wonder the drug is a good repeater. The laity buys it, the physician prescribes a lot of useless materials and get $\frac{1}{24}$ gr. of heroin as the result.

Cocillana, from which the mixture gets its name, is the bark of *Guaria rusbyi*, a tree found in Bolivia. Its action is said to closely resemble that of ipecac. Can anyone suggest a more pernicious method of practicing medicine than using this mixture or any like it for coughs? One thing is certain, to my mind, the man who uses it rarely makes a diagnosis and the firm which sells it helps him in slipshod methods of practice.

ANTIPHLOGISTINE

INDICATIONS

Antiphlogistine can be used in

Pneumonia	External Piles
Bronchitis	Moist Eczema
Pleurisy	Erysipelas
Osteitis	Frost Bites
Periostitis	Croup
Sprains	Inflammation of Bowels
Felons	Peritonitis
Sunburn	Tonsillitis
Metritis	Poisoned Wounds
Vaccination Sores	Inflamed Breasts
Chronic Ulcer	Bruises
Swollen glands	Abscesses
Boils	Endometritis
Buboes	Synovitis
Orethritis	Dysmenorrhœa

And whatever inflammation or congestion is a factor and local treatment is indicated.

Antiphlogistine is a notorious clay preparation. Notwithstanding the Pharmacopeia has added a preparation, cataplasma kaolini, which is said to resemble closely this preparation, it is little less than dangerous for the patient to use it in this line of ailments. Think of trifling with it in croup and peritonitis, to say nothing of pneumonia!

Croup should be held up to the laity as quite possible diphtheria. To persuade the parents of a child to apply clay to the throat is in the first place to do no good, and in the second place to invite danger, both to the individual suffering and to the family, for fear of diphtheria.

Pneumonia needs prompt treatment by rest and fresh air, not by clay.

Osteitis brings terrible results in its train. A physician knowing a patient to have osteitis and applying any clay preparation is recreant to his charge.

In regard to peritonitis, what has surgery taught us? That peritonitis has a cause; that this cause must be removed surgically, if our patient is not to risk his life!

ALKALOL

0.05 per cent. Alcohol

Is agreeable, non-toxic, non-irritant; combines correct alkalinity with a mild sedative and astringent action. Gives best results when used from one-half to full strength and frequently applied; particularly adapted to treating acute or chronic conditions in nose, throat, eye and ear. Cleansing and soothing when applied to any irritated or inflamed surface. A refreshing mouth and tooth wash in illness and health. In nasal or pharyngeal catarrh, hay fever, asthma, acute cold in the head, follicular tonsillitis, diphtheria or scarlet fever, it will keep nose and throat clean and add much to the patient's comfort. For burns, bruises, insect bites, ulcers, or any local inflammation, constant application by means of saturated gauze or cotton is desirable. Internally, Alkalol may be given in teaspoonful or tablespoonful doses.

Original Package, 8 oz., 50 cents; 16 oz., 75 cents.

ALKALOL Co., Taunton, Mass., U. S. A.

This is a famous alkaline wash; certainly no better, where it is useful at all, than normal salt solution and useless in asthma and diphtheria.

And so I might go on through my whole list of thirty samples. Indeed, I might go further as I have done in another article and beseech you to avoid using the compound remedies found in the Pharmacopeia. They all have the common fault of ready-made prescriptions: They are "one-sized suits for a mass of men" and further, many of them are mere copies of well-known patented formulas.

Why are such preparations used? Because we as physicians do not take pains for the best and because by our use of a drug firm's compound, we make it possible for them to sell. Do we not know that every time we prescribe a firm's special mixture, we make it possible for a patient to drug himself both to our loss and to his detriment? Since this article was written, indeed after I had started on my journey west, President Taft, in a most forceful message to Congress, has this to say about patented nostrums and the Food and Drugs Act:

The Supreme Court has held in a recent decision (*United States vs. O. A. Johnson*, opinion May 29, 1911) that the Food and Drugs Act does not cover the knowingly false labeling of nostrums as to curative effect or physiological action and that inquiry under this salutary statute does not by its terms extend in any case to the inefficacy of medicines to work the cures claimed for them on the labels.

It follows that, without fear of punishment under the law, unscrupulous persons, knowing the medicines to have no curative or remedial value for the diseases for which they indicate them, may ship, in interstate commerce, medicine composed of substances possessing any slight physiologic action and labeled as cures for diseases which, in the present state of science, are recognized as incurable.

An evil which menaces the general health of the people strikes at the life of the nation. In my opinion, the sale of dangerously adulterated drugs or the sale of drugs under knowingly false claims as to their effect in disease, constitutes such an evil and warrants me in calling the matter to the attention of the Congress.

Fraudulent misrepresentations of the curative value of nostrums not only operate to delude purchasers, but are a distinct menace to the public health. There are none so credulous as sufferers from disease. The need is urgent for legislation which will prevent the raising of false hopes of speedy cures of serious ailments by misstatements of fact as to worthless mixtures on which the sick will rely while their diseases progress unchecked.

At the time the Food and Drugs Act was passed, there were current in commerce literally thousands of dangerous frauds labeled as cures for consumption and all lung diseases, cures for all kidney, liver and malarial troubles, cures for diabetes, cures for tumor and cancer, cures for all forms of heart disease in fact, cures for all the ills known at the present day.

Unfortunately the statements were not true. The shameful fact is that those who deal in such preparations know they are deceiving credulous and ignorant unfortunates who suffer from some of the gravest ills to which the flesh of this day is subject. No physician of standing in his profession, no matter to what school of medicine he may belong, entertains the slightest idea that any of these preparations will work the wonders promised on the labels.

I might add to President Taft's sentence: "There are none so credulous as sufferers from disease," or physicians whose libraries are filled with circulars issued by drug firms. I believe that every physician in the United States, indeed every physician in the world, will agree with what President Taft has said so well. His words, I believe, must carry home to every one of my readers the points I wish to make. We, as physicians, have no right to prescribe for a patient anything but that which we know is for his greatest good. We can never fulfil this necessity by using such preparations as I have mentioned. It makes no difference whether the firm is unknown or whether it has a great name. I believe that we are perilously near being worthy of Taft's criticism of using preparations of which the statements are not true when we prescribe in such a manner, and I believe that firms who wheedle uneducated or young and inexperienced physicians into using such preparations are as guilty as the dispenser of a nostrum which he knows to be valueless.

ABSTRACT OF DISCUSSION

DR. THEODORE G. DAVIS, Los Angeles: I believe with Professor Schneider that the reason medical men of to-day use these proprietary preparations is that they know nothing about medicine, for they have not been taught medicine. They know nothing about the drugs they use. All they practically care for appears to be the dose. You cannot get the younger medical students of to-day to study pharmacology and therapeutics. I have taught students in *materia medica* therapeutics and clinical medicine and can speak from personal experience. The young men of to-day, especially in the state of California (I know it to be absolutely true) pay little or no attention to these subjects because they are not examined in therapeutics and *materia medica*. Four out of eleven students who were denied a passing mark in an examination that I gave were, without any consideration as to what their ratings were in my examination, passed in *materia medica* and therapeutics. The only way, I think, is to take the first year in pharmacy, as Professor Schneider has outlined, and let them know the drugs they are to use. They do not know one drug from another. Indeed, I became absolutely disheartened and disgusted in endeavoring to teach, and resigned from the position. It is true not only in California, but elsewhere. The young men of to-day do not study medicine and do not know how to treat the symptoms of disease. They have been taught anatomy, surgery, pathology, bacteriology and diagnosis, yet, as I have said to my classes, "What difference does it make to your patients whether you make a diagnosis or not if you cannot relieve them? If you do not know what to use, except some surgical procedure, what good does it do your patients?" A therapeutic diagnosis should be made with as great care as a pathologic diagnosis. I think that point of view is the point of view from which medical schools should take up the question.

DR. F. E. STEWART, Philadelphia: Dr. Fussell's paper deals with problems of great importance to the profession of pharmacy as well as to the profession of medicine. The term "ethical" as applied to monopolized *materia medica* products seems to me a misnomer. I can see nothing ethical in the so-called proprietary medicine business. The principle on which medicine and pharmaceutical practice is based is altruism. True pharmacy is a branch of medicine and its practitioners are under the same ethical obligations to the profession and to the public as physicians. There can be no two codes of ethics, one for the physician and another for the pharmacist and manufacturer of *materia medica* products. The dangers referred to by Dr. Fussell would all disappear if both professions would live up to their ethical obligations.

MR. LIGHTHEART, Sacramento: I have had various experiences with various physicians and I can answer in a way some of the questions that have been brought up. I see these things from a different point of view altogether. I am known as an ethical crank. I do no counter-prescribing because I think it is criminal. It is not allowed to go on in my business, but we have physicians who, for instance, advertise listerine. Who started that kind of a proposition? No one but the physicians. The same is true of other preparations. It is only a few years since we had a counter-trade on liquor antiseptics alkalinus. Who but the physician started the laity, by handing it out to his patient? Do not blame the pharmacist for all of these things; he is only too glad to put up prescriptions. I do not want to sell a "patent medicine." I try to persuade people to go to physicians. What do I get? I persuade John Smith to go to a physician; that physician sends that patient to his favorite druggist. I not only lose what little I would make on this particular transaction, but I lose all his patronage. This is a broad question. There is just as much wrong done on the side of physicians as on that of the pharmacists. It has been stated that the average physician does not know how to write a prescription. It was only the other day that I received a prescription containing strontium bromid and aromatic spirits of ammonia. A little while before I had one containing strychnin and strontium—therapeutically and chemically incompatible. I wish that physicians would come to us and say, "Here, can I write such a prescription?" They do it with me. They ring me up on the telephone. I do not

see that it belittles the physician to ask the pharmacist. If we come together as scientific and broad-minded men we will accomplish what we desire. Otherwise we will never get anywhere.

DR. M. H. FUSSELL, Philadelphia: I do not know how we are going to get the men who are prescribing these things to cease unless we hold up to their eyes the foolishness of such things. I know that unquestionably the best thing to do is to get the boy before he gets out of college, and that is what we are trying to do. Some years ago in Boston I read an article, for which I was belabored for about a year, on dispensing versus prescribing. I took the ground that it was the duty of the man who lived in a city where he had competent pharmacists to prescribe and not to dispense. In my own particular neighborhood, which is one of the outlying wards of Philadelphia, twenty-four of the twenty-seven physicians living and practicing there do their own dispensing. Now that, I think, is not right. Possibly it was not of any use for me to read my paper, but I am going to continue to write and speak on these lines.

THERAPEUTICS OF ABNORMAL HEART RHYTHM

MAXIMILIAN SCHULMAN, M.D.

Instructor in Therapeutics, College of Physicians and Surgeons,
Columbia University; Chief of Clinic in Applied Therapeutics, Vanderbilt Clinic
NEW YORK

A clear understanding of the manner in which disturbances of the cardiac rhythm are produced, and of the meaning of such disturbances, is so important to their intelligent management that I feel justified in presenting this subject, though I have nothing original or new to offer. While this subject has received the attention of many physiologists and clinicians, it is still a mystery to a large proportion of general practitioners, some of those we much respect not hesitating to admit that they "know nothing about it." This apathy cannot be too soon dispelled and it is therefore imperative that practitioners of medicine have this subject so frequently brought to their notice that they will be compelled to study it.

Whether we are ready to admit the correctness of the myogenic theory of cardiac action or not, it must be admitted that studies conducted with this theory as a basis have led to a much clearer understanding of cardiac function, and made possible an analysis of disturbances of cardiac rhythm, which in turn has made treatment of them less empiric than formerly was the case. Just as the recognition of a heart murmur is to some men, even to-day, an indication for treatment of that heart, no matter how well it may be acting, so, to very many more, is the appearance of a disturbance of rhythm a cause for anxiety and the issuing of a bad prognosis, followed by superfluous treatment, medicinal and other.

Incorporated in the adult heart is some tissue which is recognized as the remains of the primitive cardiac tube, and which is of great importance in the functioning of the heart. Modifications of this tissue lead to modifications of the normal functions. Normally, the most irritable part of this tissue is that situated at the mouth of the superior vena cava, called the sino-auricular node (Keith; Flack). Here the cardiac contraction is started and the contraction wave is then passed along to the rest of the heart. This node is therefore called the "pace-maker" of the heart's action. Some fibers of the primitive cardiac tissue are probably also scattered throughout the auricular wall, but, because not gathered in any bundles or masses, are harder to recognize. The normal cardiac rhythm, started at the sino-

auricular node, is known as the fundamental or sinus rhythm. The rest of the primitive cardiac tissue arises in the auriculoventricular node (Tawara) situated in the wall of the right auricle, near the mouth of the coronary sinus, passes as the auriculoventricular bundle (Kent; His) to the auriculoventricular septum, where it divides into two limbs, one passing down the right ventricle and the other down the left ventricle. The function of this auriculoventricular tissue is to convey the contraction stimulus from auricle to ventricle.

The cardiac muscle is possessed of the following functions:

1. The power to produce a stimulus which will excite the heart to contract: *stimulus production*.
2. The power to receive a stimulus: *excitability*.
3. The power to convey a stimulus from one part of the heart to another: *conductivity*.
4. The power to contract on being stimulated: *contractility*.
5. The power to remain to a certain degree in contraction, even when the active stimulation has ceased: *tonicity*.

A disturbance of these functions leads to a disturbance of the normal heart action. There may be a disturbance of one of these functions without any interference with the others, or, there may be a disturbance of more than one function at the same time.

Heart muscle has a quality peculiar to itself, in that, given a heart which is possessed of excitability and contractility, any stimulus being applied, which is of sufficient strength to cause a contraction, the heart will contract with all its force. The strength of contraction will in no measure be dependent on the strength of the stimulus. Heart muscle either contracts with all the power it possesses or does not contract at all. This is known as the "all or nothing" law. Contracting with all its power, the heart muscle exhausts all its stored energy and as a consequence it becomes incapable of responding to further stimulation until it has had sufficient rest to allow a certain amount of energy to be reaccumulated. This period of non-excitability is known as the "refractory period." A stimulus applied to the heart during a refractory period, will not effect a contraction. It follows as a corollary that heart muscle cannot be tetanized. The bearing of these facts on our subject will later be apparent.

The disturbances of rhythm in relation to the several cardiac functions are shown in the accompanying table:

TABLE SHOWING DISTURBANCES OF RHYTHM IN RELATION TO THE SEVERAL CARDIAC FUNCTIONS

Normal cardiac function	Resulting abnormality, when corresponding function is disturbed	
1. Stimulus production.	Sinus irregularity.	Youthful irregularity.
2. Excitability.	Extrasystole.	{ Auricular. Ventricular. Auriculoventricular.
3. Conductivity.	{ Heart-block (partial or complete)	{ Sino-auricular. Interventricular (hemisystole). Auriculoventricular (functional). (organic).
4. Contractility.	Pulsus alternans.	
5. Tonility.	{ Absolute irregularity. Pulsus irregularis perpetuus. (Auricular fibrillation, Nodal rhythm).	

The analysis of abnormal cardiac rhythm into the various types, as shown in the table is much facilitated by a study of the venous pulse. This pulse reflects the variations of pressure within the right auricle, and when studied in conjunction with the arterial pulse (and apex-