located, with a number of horses always ready, to furnish services as needed and receive compensation for each trip.

FIG. 6.—Patrol Ambulance. Seat in position, back closed.

FIG. 7.—Same, with seat up, showing supports folded back. Back open to admit stretcher.

The cost of maintaining an ambulance service of this kind in a town of 9,000 inhabitants, owning a hospital (an actual experience in this State),

was not over \$300 for a year, of which patients able to pay contributed a part.

Along the lines followed in Boston, and adopting some simple system like the one outlined in this paper, much further good may be accomplished, not only in Massachusetts, but in every city and town in the country.

The ambulances which are available in Boston, however, have reached such a number that some understanding is necessary between the Police Department and the various hospitals, so that conflicts over patients will not occur. It may even be necessary to place the responsibility for ambulance calls with the Police Department, and that all calls shall come from a central station.

In closing, I wish to thank the society for its invitation to be here tonight, and for the interest it has taken in this work.

THERAPEUTICS AND THE DRUG MANUFACTURER.¹

BY BRACE W. LOOMIS, M.D., SYRACUSE, N. Y.

On looking backward through the twenty-five years preceding the present time, it is apparent that great progress, great development and great expansion have been made in all those arts and sciences which relate to medicine. The united industry of teachers and experimenters, supplemented by that of practitioners, has been marvelous, and the results of this industry have added substantially to the welfare of human existence. The record is a brilliant one, and we may well feel elated whenever we pause from our daily labor to point to the triumphs of the last quarter of a century.

But, as Fothergill has it, "the ultimate aim of all medical research is the treatment of disease," and it may be said regarding nearly all those arts and sciences, that their activity is along lines that focus in the treatment of disease, and this art, too, the art of therapeutics, has shared in the general progress and development. Our resources of treatment are greater than ever before. Methods of attacking disease are more numerous and effective. Knowledge of remedies is more specific and accurate. Relief is more certain, more prompt; cure more frequent.

However, the path of the therapist has never been a smooth one. He stumbles at times; again, he slips and often falls down. He wanders along uncertain ways, and even appears to go backward. The same mistaken observation, the same errors of judgment, the same fallacies in reasoning may occur today that have occurred times without number in any preceding period of therapeutic activity; for the human mind still behaves very much as in the times of Hippocrates or Galen, and because this is so, the therapist is even yet inspired to many sins of omission and commission that have the age and precedent of

¹ Read before the Semi-annual Meeting of the New York State Medical Society, Oct. 15 and 16, 1901.

antiquity, notwithstanding that his knowledge of the relation between disease and its cure is greater in every way. The chronicles of medicine, compiled slowly and with infinite labor, during hundreds of years, furnish nothing more interesting than is recorded in accounts of the treatment of disease. Sickness, pain and death, liable at any time to afflict mankind, apt at any moment to seize those who are well and prostrate those who are strong—these are the common enemy. They have always been doubly dreaded because mysterious and intangible. More terrible because the attack is from within and must be fought, for there is no retreat, no running away from sickness. If the history of medicine discloses strange notions of the nature of disease and all manner of vagaries respecting its pathology, it likewise shows the most singular ideas prevailing among those who propose to fight it. The primitive conception that illness was a scourge visited by God upon his creatures, or was a manifestation of evil spirits, lent countenance to the plan of removing it by prayer, penance and sacrifice, or by resort to incantations and use of charms. Later on, as the centuries rolled along, and definite knowledge of morbid processes accumulated, methods of relief took on a sort of scientific coloring, and in many instances were founded on a respectable basis of accurate empiricism. The great past contributes a category of agents and measures almost innumerable, and their character includes every variety of crazy conception, as well as all that belongs to the practical, the sensible and the scientific. A curious aggregation of beliefs and practices; but out of the jumble of facts and fancies, of truths and delusions, of improbable imaginings and sound knowledge, have come the axioms and principles of rational therapeutics as crystals settle and form pure and clear out of turbid and unclean solutions.

As a preliminary to the consideration of certain principles of rational treatment, it seems advisable to refer to important natural tendencies of the organism that have a very material bearing on the management of illness. First of all, comes the principle of self-limitation of most acute diseases, and closely connected with this is the fact that most acute diseases having reached this natural and predetermined limit, the patient then recovers. When the records of clinical medicine are investigated, it is found that physicians during hundreds of years were not influenced by those facts for the reason that they were ignorant of them; and, strangely enough, there are many followers of our art today who ignore them likewise. To be sure, they admit them in theory, but in practice they seem to ignore them. Still another fact requiring mention because of a similar disposition to forget or ignore it, is that many symptoms rightly considered are in truth the outward manifestation of an effort initiated by the organism for its own relief and cure. Partly on account of the facts thus outlined, and partly because the fallacy involved was too seductive

to be easily avoided, most practitioners were led to habits of therapy that have their origin in an impulse of the powers of reason that nearly always dominates, namely, to combat symptoms and to seek to remove them *seriatim*. All those plans of treatment and the legion of medicines having "anti" for their prefix, are the natural result of this combative therapy. Probably its origin was coeval with the earliest and most primitive efforts toward treatment, and as a method it has been established hundreds of years. Is the sick man weak? Give him something that will make him strong. Is he restless and wakeful? Give him something that will quiet him. Is his pulse rapid? Give him something that will make it slower. And so on, taking the symptoms in series. The practice of combating symptoms on the supposition that they constituted the disease itself and were of necessity harmful, led those who were disposed to be energetic in their practice to fallacious reasoning of another kind, the consequence of which was, that in addition to too many medicines, too large quantities of medicines were administered, and the ills of polypharmacy in connection with drug poisoning were often added to the primary disease. It has been necessary to refer to this ignorance of the essential limitations of diseases, together with certain mistaken tendencies in treatment, in order to better understand the principles of rational therapeutics which were slowly formulated, and which are the outcome of hundreds of years of observation and experiment.

Briefly, the essentials of a sound therapeutic method are as follows:

- (1) Keeping in mind the tendency of self-limitation of pathological processes and the possibility of cure as a result of natural forces, never prescribe a remedy that will interfere with, or upset the conservative efforts of, the organism.

- (2) Keep the problem of treatment as simple as possible by the exhibition of few remedies, well selected.

- (3) Bear in mind the possibility of aggravating existing pathological conditions and introducing new ones, by injudicious or too heroic methods of treatment.

- (4) Remember that the benefit to be expected from remedies is generally offset or neutralized, when a large number of remedies are exhibited at the same time.

- (5) Try to remove the cause—this presupposes a careful study of the case, rather than a hasty prescription for this, that or the other symptom.

- (6) Do not forget that most medicines are two-edged swords—if a medicine does no good it is likely to do harm.

- (7) Prescribe for conditions, not diseases.

- (8) When necessary, hit hard, but not too often.

- (9) Watch constantly for symptoms that may be the result of remedies prescribed for the relief of other symptoms.

A category of principles of rational treatment might well include more than the above, but this list is comprehensive enough for argument, and will help make plain certain vicious tendencies in therapeutics which have multiplied, or at least become more obvious and general, in recent times.

During the past ten years, the volume of capital invested in the manufacture of medicines and chemicals has increased to a point nearly beyond commercial safety. Immense sums have been expended in equipping laboratories for the production of all the older forms of remedies and thousands of new ones. The capital once invested, the goods are made and put upon the market, and have got to be sold. To this end,—to the selling of the product, thousands of dollars are further expended for free samples to physicians, for “literature,” as it is called, and for the hire of salesmen who understand well how to dispose of their wares. As a result of this activity of the drug manufacturer, physicians and patients together purchase a bulk of medicines in the form of tablets, pills, granules, tinctures, fluid-extracts, elixirs, synthetic products and derivatives, that is unparalleled and almost incredible.

Manufacturing druggists are in business for revenue—not for love of science, but for profit. They intend to make the public, and that means the retail druggist and doctor and patient, pay interest and dividends on their large investments. Of course the energy and enterprise of drug dealers and manufacturers has furnished much that is valuable, but the point is that this vast commercial enterprise has its bad side, and the medical profession has been harmed by it. Used wisely, many of the new preparations are helpful to both physician and patient, but the contention is, that the methods in vogue to effect their enormous sale have produced a dangerous departure from the beaten track of scientific therapeutics. These methods are alluring and convincing. That is, they convince a sufficiently large number of those who follow the profession of medicine. Not very long since the representative of a well-known drug house admitted in the course of an argument on the subject that much harm was done by trade methods, “but,” he said, “we do it because it pays.” Doubtless it does pay the drug manufacturer, but does it elevate the practitioner to the plane of an expert prescriber—one who brings to his aid the information furnished by modern pathology and modern methods of accurate diagnosis, and who, working on such a foundation, constructs and supervises a sound and efficient plan of treatment? Does not many a physician unknowingly fall into errors that were ignorantly practised years and years ago? The same errors essentially—different in outward form, but similar in essentials to the mistakes of the fathers in medicine. Doubtless it does pay the drug manufacturer. Let us see whether it pays the honest physician. Let us see whether the quality of the prescriber’s work is improved or depreciated. In order to approach this aspect of the subject easily, it will be expedient to quote from the pub-

lished dose-lists a few of the preparations. Besides the long catalogue of liquid preparations all trade-marked and copyrighted, which are not far removed from proprietary and patent medicines, there are in the form of pills, granules, tablets, etc., antiasthmatic, anticonstipation, antidyspeptic, antimalarial pills; bronchitis, enteritis, rhinitis, cystitis, diabetic, dyspeptic, sciatica, fever, voice, heart and throat tablets. On the list is found a therapeutic inspiration called “Hooper’s Female Tablet.” There are hundreds of others. Who can deny that these aids to treatment simplify the work of the physician? If a patient comes in complaining of sore throat, give him some throat tablets. Or if the prescriber would be more specific and treat the hoarseness that may be present, let him add a voice tablet. If the sufferer should happen to be a lady, complete the combination and make it solid with a female tablet. Thus the indications are met, the road to treatment is rendered easy, and we have the word of the drug manufacturers that thousands of our brethren tread this straight and narrow way.

With the enormous array of drug combinations at hand, does the prescriber always study the individual needs of the case? Does he always try to provide a carefully thought out remedy or remedies for the patient, or does he not try to fit the case to the ready-made medicine? Does he not gradually drift into polypharmacy? In many instances has he not allowed the drug manufacturer to do his thinking for him? Instead of remaining a thoughtful, observing and scientific worker, may he not degenerate into a gentlemanly sort of “middle-man”?—the patient on one hand and the manufacturing pharmacist on the other hand—the manufacturing pharmacist who instructs him as to what he shall prescribe and when he shall prescribe it!

To these questions there are answers derived from a number of different sources. Testimony of manufacturers themselves should come first, and following is what their agents have stated in their own words. One of them says: “We sell these combinations to thousands of physicians.” Another: “It is a fact that many physicians keep our list and dose manual before them on the desk to use it as a help in prescribing.” The clever representative of a well-known house said: “Nine-tenths of the younger men buy our goods and use them for the class of cases we specify.” On one occasion a young physician who had given up practice for the more lucrative occupation of selling a new malt product, said in the course of discussion: “I have practised medicine for five years, and sometimes when out of reach of So and So’s tablets, I often had to stop and think a long time what to give for the relief of a patient. I had forgotten many of the ingredients of the tablets I was in the habit of prescribing.”

“To see ourselves as others see us” has been held to be salutary, so in this connection the views of intelligent pharmacists as to the effect

of the present commercial activity on the quality of prescription work may be worth our attention. One says: "These 'cut-and-dried' mixtures are taking the place of the carefully prepared prescription of years ago." One member of the New York State Board of Examiners in Pharmacy, long known as a leader in his profession, after referring to the injury done to legitimate pharmacy, asks: "But has not this had its corresponding bad effect on the young physicians of the day? The pharmacist notices that most of the therapeutists appear to draw but lightly on their gray matter when prescribing for patients, and paper brains seem to be the rule rather than the exception."

Finally, there can be no doubt—no reasonable doubt—that pathological conditions are complicated and added to, by misdirected zeal. It is not uncommon to find patients taking fifteen, twenty or more medicines in the twenty-four hours. Even thus handicapped, the recuperative power of the human system offsets and covers more sins than Charity—tenfold!

Systems of therapeutics come and go. Paracelsus, Brown, Resori, Stahl, Hahnemann and many other workers and thinkers have had their day, and influenced the practice of medicine. Wonderful specifics and novel doctrines spring up, monopolize the attention of practitioners, promise much, fulfil little or nothing, and in due time are reduced to whatever level their merit deserves. This has been the history of the past and will be the experience of the future. It would seem reasonable to insist that the work of the individual prescriber be as free as possible from the errors of those who have preceded him and that he should profit by the mistakes of the army of workers who have passed away, but whose record of achievements and failures lies before him. The principles of rational treatment, a few of which are dwelt upon in this paper, ought to help him to avoid many of those mistakes so often associated with the art of healing. They should warn him against the chase of many a will-o'-the-wisp, and in due time raise the quality of his efforts to the dignity of skilful therapeutics. Skilful therapeutics is no easy art to master. No man becomes a therapist from giving medicines according to such directions as are found in books and journals and in the literature of drug manufacturers. Attending lectures and recitations and passing examinations never made a therapist. Laboratory work will not educate a student up to that high standard of accomplishment. The student becomes a graduate, the graduate becomes a practitioner, but not until years have passed—years of experiment and observation at the bedside, in the consulting room and dispensary and hospital ward—does he get to be a therapist in the broad meaning of the term. So many arts and varieties of knowledge are only stepping-stones; the way is uncertain and slippery, the footing insecure, and, indeed, to this kind of learning there is no royal road.

Clinical Department.

A CASE OF TETANY IN AN ADULT.

FROM THE SERVICE OF DR. F. C. SHATTUCK, MASSACHUSETTS GENERAL HOSPITAL.

BY EDWIN A. LOOKE, M.D., BOSTON.

E. M. Q., age 36, married. Family history good. Habits: Two to three glasses of whiskey and three to four of beer per day; occasionally intoxicated. Tobacco, tea and coffee in moderation. For thirteen years the patient has worked in chain forging shop at the U. S. Navy Yard. Work is very hard and gives constant exposure to changes in temperature, before the furnaces the thermometer often registering from 120° to 130° F. From the furnaces the patient often goes to cool place, or plunges hands into cold water. He sweats profusely, and not infrequently stands in water. Much of time his work consists in holding the sledge while a fellow-workman strikes. Excellent general health. Measles and whooping cough in childhood; never sick in bed since. No history of rheumatism, cardiac, renal, gastric or pulmonary troubles. Eighteen years ago gonorrhea and questionable syphilis.

Seven years ago began to notice occasional cramps in muscles of hands and forearms, accompanied by sensations of tingling and numbness, but with no malaise, headache, nausea or vomiting. One day suddenly became much worse, and hands could not be released voluntarily from handle of hammer. When released by force, the fingers immediately assumed former position, that is, the fists clenched tightly. With continuation of work the cramps moved to muscles of loins, and finally to those of the feet and legs. Suddenly, about 4 p.m. of the same day, the muscular spasms became so severe that the patient was completely overcome, felt dazed and in sort of stupor, and rolled about the floor in agony. The sensation was described as that of severe muscular cramps rather than real pain, the affected muscles being intensely hard, board-like and slightly tender. This muscular involvement was present in nearly all parts of body, various sets being affected either at same time or successively, and lasting in most cases from a few seconds to ten minutes. Face was cyanotic during an attack; heart accelerated. Polyuria was present, but no vomiting or defecation. The power to bear hot applications without pain, which attendants could scarcely handle, indicates a moderate degree of anesthesia. The application of hot cloths to muscles with vigorous massage gave much relief after three-quarters of an hour, and in two hours the patient was able to go home. All night he felt weak and had slight numbness in muscles, but in the morning symptoms had entirely disappeared. Subsequently, at long intervals, the cramps appeared in very mild form, usually after very exhausting work.

Three years later, at 5 p.m., a second attack came on exactly simulating the first, though of