MISCELLANEOUS

BY

HAROLD N. MOYER, M. D.

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Clinical Medicine. J. Mackenzie[1] insists that clinical medicine is a science imperfectly known because the early stages of disease have not been studied and because methods of other sciences than medicine have been improperly applied. The action of medicine has not been taught by reason but by tradition.

Teachers have been trained to neglect the early symptoms of disease and pay the chief attention to the physical signs. They have had no opportunity to observe patients as general practitioners.

It may be said that the object of a scientific education is to instruct students in accurate methods of investigation, and laboratory methods train the mind to accurate observation. But it is here that the exponents of what is called scientific medicine go wrong. Instead of recognizing that clinical medicine is a science apart, with methods of its own, they simply imitate other sciences. Apart from the recognized methods of physical examination which have been in use for several generations, the whole tendency of recent teaching has been to seek assistance from methods which are useful in other sciences, such as by the microscope, *x*-rays, and other mechanical means. No doubt all these have their places, and are of service, but they are not of the essence of clinical medicine. Disease gives rise to many symptoms of a nature that cannot be brought to light by mechanical means, and they are often extremely difficult to detect, and require a great deal of further observation to explain. Except for the more easily recognized

(1) Brit. Med. Jour., January 3, 1914.

symptomatology, the tendency has been to ignore those that did not come within a certain limited category.

The backward state of medical education is well illustrated by the attitude of the profession to methods of treatment. The total absence of anything like science in this department is shown by the great variety of methods of treating any one disease, and the extraordinary recommendations that are published by different teachers. This but demonstrates that clinical medicine has not yet emerged from a condition of servitude to tradition, and even to superstition. It is not so many years ago that a schism arose because some members of the profession were led by a fantastic theory to adopt an unusual attitude to the supposed action of remedies. The orthodox views of the profession with regard to remedies were based on little better than tradition. In science there can be nothing of the nature of a schism, and it is only in matters of belief and faith that a schism can arise. If the authorities in the past had had but the faintest perception of the nature of their beliefs and how far many of these were from having a basis of truth, no schism could have been possible. But the same curious unreasoning belief in the efficacy of remedies is as rampant today as ever, and this is entirely the outcome of the clinical teaching, for the faith in ineffective remedies, though given by such scientific methods as the hypodermic syringe, is as simple and as trusting as the belief in charms and incantations of a bygone age.

The author formulates the following conclusions:

"From these considerations it will be seen that if clinical medicine is to advance, if it is ever to attain the dignity of a science, a new spirit must be infused into the teaching. Symptoms that have hitherto been ignored, and however insignificant they seem, must be systematically investigated to find out the mechanism of their production and their bearing on the patient's future.

"The early stages of disease must be searched for more thoroughly, and in this respect the little explored field of subjective sensations must be systematically investigated in order to correlate them with disordered functions.

"Prognosis must be worked out on definite scientific lines by the continuous observation of individual cases over many years.

"Treatment must be rationalized and put on an exact basis by the acquisition of precise methods of observation and by instructing the students to study for themselves the effects of remedies on the human body.

"The general practitioner must be recognized as an essential adjunct in research. To him especially we should look to find out the early stage of disease and its progress. Hitherto the lack of this assistance has been the cause of the tardy advance of medicine. How complete this failure to recognize his opportunities is seen in the attitude of the leaders of the profession. Not a single general practitioner, nor any one cognizant of his opportunities, was asked to give evidence before the Royal Commission on University Education in London. Though money in abundance is forthcoming for research no one ever dreams of giving financial help to the individual of all individuals who could undertake this work.

"The following brief description indicates lines on which clinical medicine should be taught so as to instruct students and to promote the investigation of disease:

"Take a hospital which has 100 beds for teaching clinical medicine. For teaching purposes at least four teachers would be necessary. The larger proportion of these beds—say seventy—should be placed under the care of the two junior physicians. These beds would be occupied by the type of patient that at present fills the hospital. In these wards, the student would spend half his time allotted to clinical medicine, and would be taught the physical signs of disease, the mechanism of their production, their bearing on the future life of the patient, and the indications they give for treatment. The action of each remedy administered would be watched with particular care, so that the student, by per-

sonal observation, might perceive the effects of remedies and acquire the knowledge how to determine the value of remedies. The post-mortem appearances of such patients as died should be studied, with particular reference to such physical signs as were present during life, so that the student, by direct observation, might appreciate the relation of the physical sign to the morbid condition causing it.

"After learning to recognize the more obvious signs of disease and the mechanism of their production the student would pass to the senior physician, who would have charge of the out-patient department. Here the student would study the early stages of disease—stages before the appearance of definite physical signs directly due to the disease. The symptoms here are more elusive —subjective mainly, or shown only by other organs secondarily affected.

"The senior physicians only by their knowledge, acquired after long experience, are capable of duly appreciating and detecting these more subtle signs. To these physicians thirty beds would be allotted. A proportion of these beds would be used for the purpose of the more careful study of those cases the examination of which could not be completed in the out-patient department, and in which the assistance of accessory methods of diagnosis are required, as test meals, *x*-ray, blood, and bacteriologic examinations, and cardiographic observations.

"In the out-patient department careful records of all patients, even with trivial signs, should be kept, and arrangements made by which these patients should be systematically watched for long periods of time. When they do not come to the hospital, trained assistants, with students, should be told off to visit them at their homes, and reports should be made of the course of their complaint.

"It is manifest that it is only by such methods that the progress of disease can be detected in hospital patients, while assistant and student will get an insight

into the manner in which disease presents itself for diagnosis and treatment in general practice.

"Teachers of clinical medicine should not be appointed until some ten years after qualification. During that time they will have had an opportunity of showing that they are capable of investigating disease. One-half of the teachers should have been engaged in general practice, while the others may have been engaged in laboratory work, with particular application to clinical investigation.

"Each physician appointed should be expected to engage in some field of research, having particular reference to the more common forms of disease. So far as possible the subjects for investigation should not overlap, so that the student in passing through his curriculum should be brought into contact with the progress of medicine in as many different fields as possible. In this way the teaching will be more effective, for the teacher will be speaking from actual experience, and not be merely the mouthpiece of tradition or hearsay, while the student, participating in his teacher's research, will have his interest quickened and will learn how to investigate.

"A certain number of beds allotted to the physician can be reserved for the particular line of investigation in which he is engaged.

"There should be a constant intercourse between the physician and the heads of other departments in the school, as the surgeon, bacteriologist, physiologist, experimental pharmacologist, in the investigation and treatment of the patients."

Clinical Teaching. The methods of clinical teaching in England and on the Continent are discussed by Sir William Osler[2] and the problem of how the two can be combined. He illustrates his views by his experience, especially in the organization of the Johns Hopkins Hospital. In conclusion he makes the following forecast:

"There are two important problems: Is it possible

(2) Brit. Med. Jour., January 3, 1914.

to organize in the English hospitals university clinics such as exist on the Continent, and such as those which we had at the Johns Hopkins Hospital? There are difficulties, of course, but they are not insuperable, and, once started, clinics of this type will be instituted in every school in the kingdom. Only let them be complete; the chief in full control, responsible for the teaching, responsible for the work of his assistants, and let them be well-equipped with all modern accessories for research.

"The other problem is more difficult: Shall the director of such a clinic devote his whole time to the work, or shall he be allowed to take consulting work? For the former many advantages may be claimed, though the plan has nowhere yet had a practical trial. The amount of work in a modern clinic is enormous—quite enough to take up the time and energies of any one man in conducting the teaching, treating the patients, and superintending the researches. Then it is attractive to think of a group of super-clinicians, not bothered with the cares of consulting practice, and whose whole interests are in scientific work. It is claimed that as much good will follow the adoption of the plan of whole-time clinicians as has followed the whole-time physiologists and anatomists. Against it may be urged the danger of handing over students who are to be general practitioners to a group of teachers completely out of touch with the conditions under which these young men will have to live. The clinician should always be in the fighting line, and in close touch with the rank and file, with the men behind the guns, who are doing the real work of the profession. The question, too, is whether the best men could be secured; whether academic and scientific distinctions would satisfy these men. Then for the hospital itself, would it be best to keep our best in clinical seclusion? Would there not be the danger of the evolution throughout the country of a set of clinical prigs, the boundary of whose horizon would be the laboratory, and whose only human interest would be research? I say frankly that I am not in favor of the whole-time clinical teacher. This is not surprising, as my life has

been largely spent in association with my professional brethren, participating in the many interests we have had in common. At the same time let me freely confess that I mistrust my own judgment, as this is a problem for young men and for the future. I know how hard it is "to serve God and mammon," to try to do one's duty as a teacher and to live up to the responsibility of a large department, and at the same time to meet the outside demands of your brethren and of the public. And if added to this you have an active interest in medical societies, and in the multifarious local and general problems, the breaking-point may be reached. I had had thirty-one years of uninterrupted hard work. William Pepper, my predecessor in Philadelphia, died of angina at 55; John Musser, my successor, of the same disease at 53! After listening to my story you may wonder how it was possible to leave a place so gratifying to the ambitions of any clinical teacher: I had had a good inning and was glad to get away without a serious breakdown.

Prohibition of Sale of Intoxicants in Europe. The Paris letter to the *Journal of the American Medical Association*[3] reports the extension of the prohibition of the sale of absinthe in drinking shops in France to apply to all drinks similar to absinthe, that is, to bitters and all aperitives except those with a wine base. This measure applies to all France. Some military commanders have, in addition, taken such local measures as the closing of drinking-shops, the prohibition of the sale of alcohol in certain places, or the strict regulation of closing hours.

England is requiring the closing of drinking places at an earlier hour and Russia has abolished the government manufacture of spirituous liquors.

Causation of Certain Animal Tumors.[4] The discovery of ultramicroscopic agents of infection in the form of so-called filterable viruses came at a period in the

(3) November 14, 1914.
(4) Editorial in Jour. Amer. Med. Ass'n., January 24, 1914.

study of certain diseases when the hope of finding a responsible microörganism, to the existence of which all the evidence strongly pointed, began to approach the stage of despair. The long story of unsuccessful attempts to isolate and cultivate an organism responsible for yellow fever, and the more recent experiences with the causative agent in anterior poliomyelitis which is now known to pass through filters that were at one time relied on to obstruct entirely the passage of pathogenic organisms, are fresh in the minds of those who have followed the progress of the study of infectious diseases. Without committing us in any way to a theory of the etiology of cancer, the preceding fragments of the history of medical science must be kept in mind whenever we are informed that microörganisms can have no importance in the causation of malignant growths.

The persistent assertions of those holding that the factors already established are sufficient to explain the origin of cancer are made by pathologists who have primarily been interested in the careful study of the structure of pathologic tissues. The repeated failures to substantiate the constant presence of parasitic microörganisms in human cancer have led to an unduly skeptical attitude toward everything that smacks of microbiotic possibilities. The recent experiments of Peyton Rous of the Rockefeller Institute for Medical Research have supplied the proof of filterable agencies which can induce body-cells in animals to proliferate in such a manner that certain kinds of animal cancer result. To the two chicken-tumors for which Rous and his collaborators have found the cause in filterable entities, a third has now been added. These types of spontaneous chicken-tumors thus far discovered include a pure spindle-cell sarcoma, an osteochondro-sarcoma and a peculiar spindle-cell sarcoma fissured by blood-sinuses. Despite the fact that the three transferable neoplasms are very unlike both histologically and in their general behavior, the entities causing them appear to have much in common. Not infrequently thus far the filtrates prepared under the best conditions from malignant material have proved entirely innocuous. This is doubtless due to the narrow mechanical limits within which the causative agents are filterable. When growths are engendered by a Berkefeld filtrate passed through cylinders which are impermeable at the same test to small bacteria, they have the distinctive characters of the strain of tumor which furnished the material for filtration. Two of these new causative agents retain their activity in tumor-tissue that has been dried or glycerinated. All are strikingly dependent for their action on derangement of the tissue with which they are brought into contact. When this factor is supplied, for example, by the addition of kieselguhr powder to the filtrate, the percentage of fowls that develop tumors is much increased, and the growths themselves appear sooner and enlarge more rapidly. The kieselguhr, injected alone, does not cause tumors. A limpid tumor-filtrate injected into the breast-muscle finds its point of action in the track of the injecting needle, and there results a discrete growth from one center. When powdered kieselguhr has been added, the growth is multicentric, and appears all at once as a mass of coalescing foci. In fowls inoculated intravenously with a chicken-tumor filtrate the tumors have been found to arise at sites of tissue derangement.

The newer researches strongly suggest that the causative agents of these animal tumors are of about the same size and of the same natural class. The Rockefeller Institute investigators reach the modest conclusion that: "It is perhaps not too much to say that their recognition points to the existence of a new group of entities which cause in chickens neoplasms of diverse character." This is, indeed, a step in the direction of scientific progress.

Death From Freezing.[5] In the United States deaths from freezing form at most a very small proportion of the losses of life which require classification. As a rule circumstantial evidence must assist to make the determination of this mode of death comparatively easy, though alcohol and the rigor of climate are doubtless interwoven in many a case so as to render it difficult if

(5) Editorial in Jour. Amer. Med. Ass'n., February 21, 1914.

not impossible to place the burden of immediate cause on the real factor. Death from freezing acquires a distinctly greater prominence, however, in countries like Russia, where the number of cases is reported to reach from 500 to 700 annually, and where in a single city like Riga the cause of death is attributed to cold at 9 per cent. of the medicolegal necropsies.

Reliable signs of death from undue cold are desired not only in those cases in which alcoholism may be a complicating and primary factor, but also in the case of a not inconsiderable number of new-born infants who are peculiarly susceptible to the fatal effects of the low temperatures prevailing in certain countries. Here the necropsy findings give little in the way of directive evidence. Most authorities in medicolegal matters have passed over the subject as one either devoid of serious interest or else unable to furnish a helpful solution.

The cause of death from extreme cold has been associated with a variety of pathologic consequences which doubtless coöperate in many instances. We may refer to the accumulation of carbon dioxide; the paralysis of the vagus nerve or of the vasomotor center; the undue loss of heat from the body; the engorgement of the heart with blood; an anemia of the brain; destruction of the red blood-cells, etc. None of these conditions leaves a record which can be deciphered as characteristic, if indeed it can be detected at all, at necropsy.

Dr. Krjukoff of the Institute for Legal Medicine at the University of Moscow has reached the conclusion that the examination of the liver for carbohydrates will furnish a clue for discriminating between death from cold and death from other causes leading to a sudden end. Among the latter are included such circumstances as injury, asphyxiation, hanging, drowning, poisons, cardiac failure and other conditions in which life is precipitately terminated. Here there is little if any opportunity for nutritive changes, such as the transformation of the glycogen in the liver, to intervene. Cold, on the other hand, is a vigorous promoter of metabolic changes, particularly such as will liberate energy in the

form of heat to conserve the threatened body temperature. Krjukoff argued that it is more than likely that the readily available carbohydrate of the liver would speedily and early be drawn on in the physiologic struggle to avert the impending catastrophe. This is at any rate in accord with evidences respecting the effect of lowered temperature on animals. In ten cases of death by cold (in man) glycogen was entirely lacking in the liver. Where intoxication with alcohol entered as a factor, liver glycogen was still found present.

Infant Mortality and Alcoholism.[6] M. Paul Juillerat, member of the *Conseil d'hygiene et de salubrité* of the department of the Seine, and Dr. A. Filassier, chief statistician of the city of Paris, have just published, in the *Revue philanthropique*, the result of researches which they have made into the causes of infant mortality in Paris. This article shows, concisely, the ravages of alcoholism. In the period of ten years from 1903 to 1912 inclusive, of 97,885 children who died, 53,619, almost half, were children under eleven months old. Congenital debility is responsible for 12,342 of these deaths. However difficult it may be in the present state of statistics to place the cause with absolute certainty in these matters, Juillerat and Filassier do not hesitate to say that this enormous proportion must be attributed to alcoholism in the parents of the congenitally debilitated children. Dr. Jacquet's statistics are particularly instructive in this respect. In the investigation which he made from May 1, 1912, to May 1, 1913, at the hôpital Saint-Antoine, he divided the 396 patients whom he examined into three classes, with a total of 879 children; alcoholism in moderation (those who drank a liter of wine, alcohol or, rarely, aperients); decided alcoholism (those who drank habitually from 1.5 to 2 liters of wine, alcohol or absinthes rather frequently), and very decided alcoholism (those who drink habitually 2 liters of wine or more, aperients, alcohol, occasional repeated absinthes).

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(6) Jour. Amer. Med. Ass'n., July 25, 1914.

MORTALITY AMONG THE CHILDREN OF ALCOHOLICS.

	Alcoholic Consumption	Births	Deaths	Per Cent.
Moderate	141	305	83	18.78
Decided	108	248	115	26.01
Very decided....	147	326	244	55.47
	396	879	442	.....

Of these 442 dead children, 272 succumbed in early infancy. Thus, the children of these 396 patients, all addicted to alcohol to a greater or less degree, gave a round mortality of 50.28 per cent.

Juillerat and Filassier then show that in different domains, medical and social foresight have noticeably diminished the infant mortality. This is the case with diphtheria, pulmonary tuberculosis, tuberculous meningitis, syphilis, diarrhea, etc. In contrast to this, so far as congenital debility is concerned—which furnishes so considerable a contingent to the mournful record—there has been almost no amelioration.

Chondroitic Acid. This acid is a complex organic acid, more properly called chondroitin-sulphuric acid, which is found in small quantities in normal urine. It has hitherto attracted little attention and there are few data indicating that it has any physiologic or pathologic importance. Pollitzer,[7] however, has published observations, which, if confirmed, will require that the clinician have a closer acquaintance with this substance. Chondroitin-sulphuric acid has been recommended as a delicate test for albumin, when added to an albumin solution acidified with acetic acid. Conversely, albumin acidified with acetic acid may be employed as a precipitant for chondroitin-sulphuric acid. Pollitzer has found that, in the presence of a serum albumin, urine containing chondroitic acid gives a precipitate on the addition of acetic acid in the cold. A large part of the precipitate which appears in the urine of patients with orthostatic albuminuria, according to Pollitzer, is due

(7) Med. Klin., December 21, 1913.

to chondroitic acid. The presence of chondroitic acid is recognized clinically by the addition of a 1 per cent. serum-albumin solution acidified with acetic acid. By means of this reagent, Pollitzer was able to demonstrate the presence of chondroitic acid in young patients, even when there was no albumin in the urine. He believes that the substance is produced in the kidney by a slight degree of irritation. It is found particularly in the urine of children and young persons who are the subjects of tonsilitis or have chronically enlarged tonsils. It is not found in the urine of adults. The explanation of this fact he refers either to a modification of the action of the kidneys or to the presence of some defensive factor in the throat that prevents the absorption of bacterial toxins. As stated above, chondroitin-sulphuric acid seems to be a characteristic product in orthostatic albuminuria. In this condition it may be found in the night urine which is not albuminous. If Pollitzer is right, the reaction for chondroitic acid should be included in the routine examination of the urine in children and young persons. This test may reveal a condition which needs curative treatment applied to the tonsils. Such treatment with proper hygienic measures may serve to prevent more serious disease of the kidney in later life.

Occurrence of Urinary Calculi. Urinary calculi are of more frequent occurrence in certain "stone districts." Some of the Scandinavian countries have been reputed to be free from the existence of these concretions, whereas in certain other regions of the world stone is a common malady. The incidence of urinary concretions can scarcely be correlated with climate or geographical location, for the "stone regions" occur in both warm and cold climates, inland as well as along the coast, in the highlands and lowlands alike.

A. Hirsch[8] concludes that the Asiatic continent ranks first in prominence in the distribution of urolithiasis throughout the world. Even in Asia, however, there are

(8) Handbuch der historisch-geographischen Pathologie, 1883, iii, 319.

areas of immunity, so to speak, mingled with those in which stone is common. The northwestern provinces of India are said to be pre-eminently afflicted, whereas urinary calculi are rarely reported in the region of the lower Ganges. Similar differences exist between north and south China; the former is free from stone, which is so common in the south that special hospitals for those suffering from urinary lithiasis have been developed, in Canton for example. Indeed, this form of disease has been described as endemic for the province of Canton.

The *Journal of the American Medical Association*[9] calls attention to the divergent explanations for the peculiar distribution of urolithiasis. So long as the cases were grouped together in a common category quite independent of the real chemical nature of the calculi themselves, one could scarcely expect much progress in the interpretation of such disease. It would be quite as rational to class all fevers, as was once done, in a single group and hope to unravel their etiologic significance from a single symptom-complex. Concretions of inorganic salts of calcium and magnesium, oxalates, uric acid and urates, cystin and rarer components have too often been taken without further analysis as the indication of a common malady—stone. No stretch of chemical or physiologic imagination will permit so heterogeneous a group of compounds to be ascribed to a common origin, or their deposition in the kidney, bladder and urinary passages to be uniformly charged to an identical cause.

The investigations of recent years leave no doubt, further, that the individual "stone districts" show an unlike predominance of the different chemical types of calculi. In India, for example, oxalates appear to be quite prominent, pure uric acid concretions being relatively scarce. In Egypt, mixed calculi composed of oxalates and urates predominate; whereas in England they are said to be found rarely, if ever, although urate concretions are in turn extremely common there. A careful investigation made by Abderhalden and Hanslian[1] on calculi from the inhabitants of Asia Minor showed that they are essentially inorganic in character, calcium and magnesium being conspicuous. In contrast with these varied types is the latest report regarding the calculi of the Chinese, in which uric acid appears to be even more dominant than it is among the European specimens.[2] It is as yet almost futile to account for such group variations—for the incidence of oxalate concretions in Egypt and India, of urate calculi in Europe and China, or the comparative immunity of the negro races of Africa.

(9) Jour. Amer. Med. Ass'n., April 25, 1914.

The variations in "stone districts" are not to be accounted for by posture in micturition nor by parasitic causes. We realize today that it need not be a preponderance of meat or vegetable diet, respectively, which occasions the presence or absence of urinary urate deposits. The balance of acids and bases in the organism, the equilibrium between these factors as illustrated in the resulting reaction of the urine, may be the determining cause of precipitation or solution. There is an interplay of many chemical components, the upset of which may spell disaster. The symptoms of gout, for example, are not confined solely to the meat-eating peoples. Typical vegetable dietary products like wheat and potato bring about quite unlike consequences in respect to the metabolic "rubbish" which they leave behind them. Until a more detailed knowledge of the diet of diverse peoples becomes available we can scarcely hope to solve the problems of the incidence of urinary calculi. Increasing knowledge in respect to the chemical features of both food and urine is likely to lead more speedily to defensible conclusions than are hypotheses involving questions of race, geologic conformation or contemporaneous disease.

Cure of Rheumatism and Joint Trouble.[3] One of the

(1) Abderhalden, E., and Hanslian, R.: Beitrag zur Kenntnis der Zusammensetzung der Blasensteine von Bewohnern Kleinasiens. Versuch, die Ursache ihrer Entstehung zu ergründen, Ztschr. f. physiol. Chem., 1912, lxxx, 113.

(2) Pfister, E.: Chinesische Blasensteine, Zeitschr. f. Urol., 1913, vii, 945.

(3) Editorial in Jour. Amer. Med. Ass'n., January 17, 1914.

commonest affections that the physician has to treat is called "rheumatism" by the non-medical and by probably a majority of physicians alike, as the symptoms consist of pains and aches, sometimes rather vague, but often acute and definitely located in or around the joints. Not infrequently, a distinct amount of disability goes with the affection; the ordinary use of an arm or a leg is uncomfortable or impossible. The cases occur in all forms and the patients are of all ages, though the condition develops much more commonly beyond middle life than in the earlier years.

These cases, grouped together under a generic term, are usually considered as due directly or indirectly to some disturbance of metabolism, some absorption of toxic material from the intestines or some poisonous substance elaborated in the blood. For a long while it was almost universally agreed that these symptoms were due to the presence of uric acid in the system consequent on a disturbance of nitrogen metabolism. A number of remedies for this conditions have been on the market for many years and have obtained a reputation because of the number of cases of this kind in which they were said to cure. The uric acid explanation began to lose its vogue about twenty years ago and now there are few well-informed physicians who accept it as explaining these cases. The remedies directed against uric acid, however, still continue to be used in large quantities, sometimes by old-fashioned physicians, but much more by the laity, which loves to roll under the tongue that delectable morsel of pseudo-science, the term "uric-acid diathesis."

As uric acid went out, the question of some other disturbance of nitrogen metabolism took its place. We heard much of the purin bodies and of various disturbances of protein digestion, and, above all, of improper protein absorption, as the source of the symptoms that are so common and form so large a part of the occupation of the general practitioner of medicine. A number of remedies directed particularly to the amelioration of these disturbed conditions and the improvement of

the internal nutrition were put on the market. Most of them exhibited evidence of their usefulness by "cures." At present, wide-spread attention is attracted to a whole series of such remedies that are claimed to be almost specific in their action on rheumatic conditions, that is, the pains and aches in the neighborhood of joints supposed to be rheumatic.

The most interesting thing about these conditions is the history of their successful treatment, not for a generation or so, but for two or three centuries. Patients complaining of vague pains around joints and in groups of muscles in various parts of the body have supplied a large proportion of the "cures" attributed to remedies and treatments at first heralded as marvelous and later proved ineffective. In its original form the Leyden jar was scarcely more than a toy. In Europe many healers of disease produced wonderful effects with it in just this class of patients, the old persons with chronic diseases of the joints and muscles. A little later, when the first electric machine that would give a continuous series of sparks was invented, this was employed in such cases, with wonderfully good results. Almost needless to say, the physical effect of the electric machine on the human body was so little as to be quite negligible, but it worked a great many cures. A little later in the eighteenth century, Galvani made his demonstration of the twitching of a frog's leg when two metals in contact with each other are applied to the nerve and muscle. His demonstration led to a prolonged scientific discussion as to the relationship between electricity and vital force, with a great deal of emphatic assertion on the part of certain scientists that at last the secret of life had been discovered—we are always discovering the secret of life—and then a new field of therapy was open. Elisha Perkins effected many "cures" by stroking patients with two pieces of metal, which he called "tractors." His expulsion from the medical society of Norwich, Conn., on the ground that there was no value in his tractors only gave the astute Yankee from the Wooden Nutmeg State an opportunity to advertise that the medical pro-