will not see a physician under any circumstances. The first class, the druggist advises to see a physician, perhaps recommends the particular doctor, the patient sees him and all is well. With the second class he has more trouble. It is composed of those who either consider the trouble too trivial on which to waste a physician's fee, or who know a patent medicine which cured a case exactly like theirs. The druggist may be able to talk him into seeing a physician, but more often he must either sell a patent medicine, of which he knows nothing, or recommend "something better," of his own manufacture usually, which he knows to possess some merit. This he must do or lose a customer, perhaps permanently. The third class is the worst. To it belongs the man who has been unfortunate in the choice of physicians, and who has formed a bad opinion of the entire profession; and the man who knows as much medicine as the doctors. The first may be persuaded, but the last never. The man of the last type informs the druggist that he has a pain, and Dr. Blank uses Anti this or that for pain and he wants some. Or he may have some other ailment and want this or that Ine or Compound or Elixer, "the same Dr. Dash used when my brother was sick." When the druggist demurs and suggests that these are powerful medicines to be used only by physicians, he is probably informed that "Dr. Space told me to keep Antiblank in the house and use it whenever I needed it;" which is unanswerable.

The average man who gets a mixture over the druggist's counter makes his own diagnosis, and if the druggist does not put him up something, either buys a "patent medicine" or finds a man who will accommodate him. Not long ago a man came to me suffering from a severe cold. On inquiring as to previous treatment, I found that he had been taking freely a coal tar and codiene tablet, supposedly put up for physicians' prescriptions only. I asked him how he happened to take them and was informed that "Dr. Blank told me last year that they were good." That was unanswerable. And think, the druggist meets these cases every day.

We as physicians have done much to bring about this condition of things. We have done it through ignorance and thoughtlessness, but we have done it just the same. It is an evil that is sapping the medical man and the pharmacist. Let us as physicians stand with the druggist to remedy this evil. Let us write more for our own formulas, compounded at home and less for the ready-made prescription. Let us think more for ourselves, instead of letting this or that company do our thinking. Protecting the druggist means protecting ourselves. Let us not forget the druggist, who would not forget us, but stand solidly with him for a closer bond and better understanding between the professions against the manufacturer who would convert the druggist into a mere bottling machine and the physician into an automaton signing ready printed prescriptions for Dopine in the original twelve ounce bottles.

WHY SHOULD ROENTGOLOGY BE PRACTICED ONLY BY THE PHYSICIAN?*

By W. LEHMANN, M. D., San Francisco.

AMONG all the different names given to the many branches of modern therapy and diagnosis aided by means of "rays," none has been accepted generally for the management of the rays discovered by Roentgen. That name should include the diagnostic as well as the therapeutic use of these rays, and exclude the application of radium, of ultra violet light of different sources, and others. The most generally used expression is radiography, or radiotherapy, in spite of the origin of the word, which would include all other kinds of rays, and in spite of the confusion with radium. The only word which would avoid errors is the word combined with the name of the man who presented us with that powerful agent, and speaking of Roentgoscopy, Roentgography, Roentgotherapy and Roentgology at the same time we would pay an honor which we owe to this man.

Thus, excluding all the different sorts of phototherapy, I would like to concern myself to-night to the handling of the X-rays, or Roentgen rays, and would include in the word Roentgology the therapeutic application of the rays and the use of them as a diagnostic means. From the standpoint from which I look at the matter today we are obliged to speak of each part in a different way. The Roentgotherapy has been developed very greatly in a comparatively short time, and gives undoubtedly excellent results, but a number of treatments, each treatment in a certain position of the patient, it needs a careful handling with the tube and a thorough protection of patient and physician. All that takes time. Likewise it takes time to get good plates and to study them for Roentgo-diagnosis. The busy practitioner, if possessing an X-ray outfit, is soon inclined to give the plates to the photographer, or to go ahead with waiting patients while the one under Roentgo-treatment is watched in the meanwhile by some of his office help.

On the other hand skillful laymen have learned the interesting matter and mastered the technical part within a very short period; they have opened X-ray laboratories to help the busy doctor and to do the Roentgen work for him. Many physicians with the experience that a thorough knowledge of the matter and a careful observation of the many little points—that is to say, that plenty of time is necessary to obtain good results in every case—were only too glad to get such opportunities.

But there are many dangers. One of the most important branches of modern medicine has been left to the laity, and one of the most powerful and at the same time most dangerous remedies has come into discredit oftentimes by accidents occurring through the work of these laymen. After all it does not seem unnecessary to state and to explain some of the many reasons which should force us to hold this potent agent in our own hands and to avoid bad results, the responsibility of which is left to us, nevertheless.

As regards the therapeutic part, it is an almost generally accepted statement that only the doctor should handle this powerful agent. Everybody who deals with the X-ray knows that the results obtained differ very widely according to the apparatus used, to the proper relation of primary current and secondary discharge, to the number of interruptions, and last, but not least, to the changeable vacuum of the tube. We all know that the quality of rays sent out by a high vacuum tube is entirely different from the quality of rays given from a low or soft tube. By means of a very high tube we know that we may treat a patient every day or every other day for a long time without any bad results, without producing a burn, and, therefore, we use that kind of tube in cases in which we intend to treat deep-seated diseases, internal troubles or subcutaneous tumors. On the other hand, we take a low tube in superficial skin diseases in order to produce a reaction of the upper layer of the skin by the least penetrating rays which will be absorbed to a more or less degree by the skin.

According to the nature of the affection to be treated, we differentiate, therefore, between low, medium and high tubes, between tubes of weak or strong light, between light produced by a high number of rapid and short interruptions, or a secondary discharge following less breakages. Following this it is clear that every one who gives X-ray treatments should know his apparatus and its powers, should know all technical things relating to the proper quality or quantity of rays obtained and should know all facts which would change the given condition within a certain time. Ch. L. Leonard, the well-known expert of Philadelphia, said recently: "Varying qualities of Roentgen rays produce different effects, and the

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quality must be adapted to the individual lesion. The difficulty in administration lies not only in adapting the proper quality of ray and dose to the individual lesions to be treated, but also in the fact that the clinician must know how to produce the dose with a complicated mechanism and must be able to recognize when the right quality and quantity are being employed by their clinical effects. While any dose and any technic will produce some effects, exact dosage is essential to the efficient employment in difficult cases, and as with all other powerful remedies, clinical experience in adapting the dose to the individual patient counts in the final result."

We all know that a tube changes its vacuum and its properties sometimes within a few minutes, and it is not only necessary to observe this changed condition very closely, but it is also necessary to estimate and judge the physiological effect upon the patient. Especially in cases in which we follow the modern rules of Roentgotherapy; that is to say, where we are producing the necessary reaction of the skin by one session, cases where the single treatment usually takes up a longer time, the possible variation of the vacuum-quality is to be considered seriously and carefully. On the other hand, in cases with a slow, gradual treatment upon a deeper affection, such a close observation of the patient and his condition is necessary that only the physician who has given these single treatments and who has followed the course of the disease will be able to estimate the effect and to determine at a given moment whether the treatment should be continued or stopped and the result be waited for. With regard to this latter statement, it is necessary to know each bit of a sign of beginning reaction or dermatitis, and to be able to judge what effects may follow this first appearance. I would like to draw your attention to the fact that a so-called ante-reaction, appearing previously to the real reaction, has been observed in several cases, consisting of an erythema like redness which follows the treatment within a few hours or days while the true or real reaction usually appears, as you know, within two to four weeks. This preceding reaction, the nature of which lack of time will not allow me to explain tonight, has according to Schmidt, a certain relation to the individual susceptibility towards Roentgen-rays. My experiences show no influence at all upon the resulting effect. In order to diagnose this condition or to exclude it—a very important fact in considering the continuance of the treatment—it is necessary to know the quality of tube used, the distance of the tube from the affected part, the time of exposure, etc. Every one will agree with me that only physicians are able to diagnose conditions of this kind and to estimate their importance.

Another point which should not be overlooked is the late or after-reaction following X-ray treatments, even successful ones, sometimes one or two years afterwards. The atrophy of the skin, the development of more or less superficial teleangiectases depend not only upon the degree of reaction produced, but within one of these degrees reached, upon the quality of the rays changeable every minute.

It does not need to be mentioned that the time of exposure or quality of treatment base not only upon an exact diagnosis, in so far as nearly every affection curable by Roentgen rays has its own indications and rules, but upon an individual handling with the different individuals. It does not seem necessary to state again that only the physician is able to observe this; that only the physician familiar with the Roentgen rays can give treatments with the desired effects.

Not quite as clear seems the question in the diagnostical direction. All these little technical things, the exposure, the developing and fixing of the plate, etc., take up the physician's valuable time to an unallowed degree, and it seems entirely sufficient that the finished plate presented to the physician should enable him to make his diagnosis.

But here are several points to be taken into consideration. Only the man who is familiar with every detail of the technic, who knows the matter practically and theoretically, the drawbacks and advantages of methods in this line, will be able to point out the correct diagnosis. It is easy to find a fracture or dislocation, but to diagnose bonal disease, as, for instance, atrophy or suppuration, or to give the differential diagnostical points in internal troubles, is difficult and needs a thorough acquaintance with the matter. It is necessary in all the more obscure cases to compare Roentgological and clinical findings, or in other words, to use this diagnostical means in a certain relation to the case.

In the first part of this paper I spoke of the different quality of the rays going out from different tubes and accordingly their peculiar effects. The same point has to be considered in the diagnostical use of the Roentgen rays; rays with a small penetrating power will be absorbed by the softer tissues of the body, and will cast a shadow of the muscles or muscular organs while penetrating rays are almost only absorbed by bones, metallic foreign bodies, etc. Soft tubes will show, according to the partial absorption of their rays, differentiations between normal, transparent lung tissue and areas of infiltration, will show the distinct outlines of the branches of bronchi and pulmonary vessels and peribronchitic processes of pathological nature. High tubes, with apparently the same brightness of light, penetrate such lesions and do not allow a diagnosis of this kind at all. While therefore the diagnosis of pleuritic thickening, pericarditic adhesions or lung affections can be made only by means of soft and medium tubes, the same tube will never furnish us a picture of the vertebræ in their structural detail. While, to use another example, the detail of the bones of the head can be demonstrated nicely with a higher tube, the shadow cast by the skull is of a certain equal density, caused by the parietal vault without any regard to the skull contents; soft tubes only do not penetrate these, that is to say, the skull shadow shows differentiations, denser areas corresponding to infiltration or tumors of the brain, only by means of soft tubes.

Likewise with the extremities: only tubes of certain properties enable us to diagnose pathological changes in the softer tissues like arterio-sclerotic thickening, degeneration of the vessels, or tumors, while the exact relation of the bones in knee or hip joints must be figured out with high tubes.

It is therefore not sufficient to send to the "X-ray man" for a chest plate or a picture of the head, but it is necessary to know something about the lesions to be looked for, viz: "the X-ray man" needs professional knowledge or better, the physician needs to be acquainted with Roentgology. Very often you will not get the results required, if you do not do the work yourself.

A further important feature not to be neglected is the correct position and distance of the Roentgen tube from the object to be represented. A few examples will show that. Sternum and column of dorsal vertebræ and both the right ventricle of the heart and the large vessels will cast one shadow without detail if the tube is in a central position above the chest. In order to separate these shadows, to show, for instance, tuberculosis of the dorsal vertebræ, it is necessary to eliminate the cast of the large vessels and the heart; we are obliged to project the latter shadow sideward and will get the desired result by bringing the tube to one side above the lateral thoracic wall—the rays directed obliquely throw the shadow of the part more distant from the plate further than the shadow of the near part, that is, of the column of the vertebræ.

On the other hand, an exact central position of the tube is needed in cases of heart trouble, for instance. How shall we diagnose an enlargement of the left

ventricle if the tube located above the right side of the thorax gives an enlarged shadow by projection? The example of the joints, especially of the elbow joint shows how necessary the knowledge of anatomy is for the man dealing with Roentgology. You know that the question of osseous union between epiphysis and bone shaft has been settled mainly by the help of the Roentgen rays. According to the development of this union we are able and are now accustomed to judge the age of the individual even from the plate. It should not be necessary to state that the exact knowledge of these things is needed for a diagnosis and yet one often hears the most curious explanation about epiphyseal separation and similar conditions. Still more difficult becomes the question of a possible fracture or dislocation from the fact that normally the shadows of these parts are covering one another in radiographs. We may separate easily, for obvious reasons, these casts but the diagnosis becomes more and more questionable, in the same degree, as we change the picture of the normal relation of the bones.

And furthermore, how shall a person without anatomical knowledge be aware of the fact that, for instance, the neck of the femur can be demonstrated only by rotating the leg inward? Or how shall a person who is not taught anatomy and physiology thoroughly, know that the anterior parts of the lungs sinuses can be represented only if the patient lies on the stomach and the tube is above the clavicles?

All these points are especially of interest in cases where a small plate only shall give a certain part of the body. We know that under the same circumstances, with the very same tube, distance and time of exposure a small plate gives better details and less diffusion than a large one. We know that the results are better by cutting out with diaphragms all unnecessary side light and for that reason we take the diaphragm as small as possible. The secondary rays, the main source of diffused shadow and blurred pictures will be produced in any substance and at any body the rays strike, even in the air; in order to avoid these bad secondary effects we use cylinders as diaphragms as with the "compression-diaphragm." Now by all these procedures we save quite a good deal of money which large plates usually cost, and we get results very far superior to those without such hints, but it becomes at the same time more and more difficult to get the desired part, as for instance, the hip joint in a very stout person, upon the plate. Pressing the tube of the compression diaphragm into the abdomen in order to point out an exact diagnosis in supposed troubles of certain parts like kidney or bladder stones, extra-uterine pregnancy or so, the anatomical features must be borne in mind.

Moreover, in order to verify the exact size and position of the stomach we inflate it with air by means of sound and bulb, or by powders of sodium bicarbonate and tartaric acid, internally given; or we mix with the food bismut emulsion for the purpose of observing the peristaltic power of the bowels. We fill the bladder and the bowels after thorough movement and evacuation with air to get better pictures and better diagnostical results of the abdominal organs. Is it right to let people, unacquainted with the human body and without professional knowledge, try their unexperienced hands upon patients? All these valuable methods for diagnosis are entirely free of danger in the hand of a trained physician and should be directed by him only.

An important part of the Roentgen-diagnosis, not to be forgotten, is the screen examination, which enables us to observe some of the internal organs in motion. We follow with our eyes the excursion of the lungs and the movement of the diaphragm, we compare both sides of the latter and are enabled to draw conclusions regarding to subdiaphragmatical or pulmonary affections which impede the normal motion on one or the other side. Well known and generally recognized is William's sign, lessened motion of the diaphragm on the side of an affected lungs apex. Only recently in an interesting case my attention was drawn to a more close observation of the stomach by the high, almost immovable left diaphragm caused by a big tumor of the stomach revealed thereby.

Anyone who has done orthodiagraphic work knows how far superior this measurement of the real size of the heart is in comparison to even the best and most experienced clinical percussion.

Many examples in this line are easily to be given, in all the value of a close comparison of plate with screen examination becomes apparent. One of the most striking instances is aneurysma of the thoracic aorta, cases in which often only screen examination will furnish the last and most essential differential point against chest tumor, the observation of true pulsation.

It is impossible to leave such methods to the laity, for the sources of error are very great, sometimes even hard to avoid by experts in Roentgen work, and the requirement of good technic in Roentgography cannot be separated from the required knowledge in anatomy and physiology possessed only by the trained medical man.

FATTY DEGENERATION OF THE HEART.*

By P. M. LUSSON, M. D., San Jose.

THERE is a disease so insidious and slow in its usual course that the seal of death is often cast on some people of great intellectual force, while in the active pursuit of their vocation, without their being aware of it; and, were it not that they are liable to suffer from occasional pangs of pain and dyspnea when walking fast or climbing stairs, or some palpitation of the heart with a feeling of suffocation, they would not know that they were sick, so, many valuable lives perish unexpectedly and suddenly. I refer to the disease known as fatty degeneration of the heart.

There are two forms under which fat presents itself as a disease of the heart. In one form the fat, containing oil identical with that found in other parts of the body, grows upon and extends over the surface of the heart; it then encroaches on and insinuates itself between the muscular fibers, in some cases to such an extent as to completely conceal them when the examination is made. In the other form, a fatty matter, composed of granules and small oil globules, occupies and fills the sheaths of what were previously muscular fibers. In the one form of disease, fatty tissue grows on and outside the fibers; in the other, the muscular fiber itself degenerates into molecular fatty matter. This distinction has given rise to the terms "fatty growth and fatty degeneration." The first corresponds to all cases in which fat only constitutes the morbid condition, while the other is restricted to those cases in which the muscular fibers degenerate into fatty matter.

When portions of the heart suffering from fatty growth are examined under the microscope, it will be found that where the growth is most advanced few muscular fibers can be seen, and the intervals between them are occupied by fat cells. Proceeding inward we find the fibers become more evident, the fat cells fewer, and finally we have the fibers beneath the endocardium with a few cells amongst them. The fibers, even when overwhelmed with fat, may retain their organization, but in all cases their course and direction is modified and disturbed. The existence of the fibers, though concealed, explains the persistence of the heart's action in those cases in which the muscular walls appear to be replaced entirely by fat. In some cases, little masses of fat appear beneath the endocardium. They vary in size from that of a pin's head to that of a pea, as described by Dr.

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