

patches described above, thickened, rough, sharply outlined, and covered by papery, snow-white scales. The scales may eventually be cast off, and then the natural lines and furrows of the skin, vastly exaggerated, give the patch a markedly rugous appearance. The shape of these patches is sometimes grotesque, bands, angular lines, and stellar radiations projecting out from the main area.

Etiology.—The causation of lichen ruber, as of lichen planus, is unknown. It usually affects young adults, but no age is exempt. A fatal termination is to be expected, though some cases have been reported as cured. Even where marked amelioration has occurred, the disease has generally relapsed, sooner or later, and the patient has died of marasmus.

Pathological Anatomy.—The pathological condition is found to be a paratypical keratinization of the horny layer, most marked about the hair follicles. Later, there are a cellular infiltration and thickening of the rete.

Diagnosis.—The disease is sufficiently characteristic to prevent its being confounded with other affections, if its history is borne in mind. Yet in certain stages it might be mistaken for eczema, psoriasis, or lichen planus.

The condition of the hands and face, when the disease has lasted a long time, is very similar to that seen in chronic eczema. But the presence of horny papules on other parts of the body, and often the existence of thickened patches covered with thin white scales, will suggest the diagnosis.

From psoriasis the squamous patches may be differentiated by the less marked scaling, the absence of an annular arrangement, the failure to clear up in the centre, the avoidance of the usual sites of predilection, and the recognition of horn-capped papules outside the main patches.

Lichen planus differs from lichen ruber in its flat-topped, angular papules, its waxy sheen, its violaceous color, its limited area, and its tendency to get well.

Treatment.—When the exceedingly chronic nature of this disease is remembered, and its tendency toward a fatal termination, it will be seen that the treatment is very unsatisfactory. The best chance for recovery lies in arsenic, which should be pushed to the point of producing slight symptoms of poisoning, and should be continued for a long time. Crocker thinks that pityriasis rubra pilaris, which has been considered in this article as synonymous with the milder forms of lichen ruber acuminatus, should never be treated with arsenic, but does well under pilocarpine. Tonics, and a mode of life

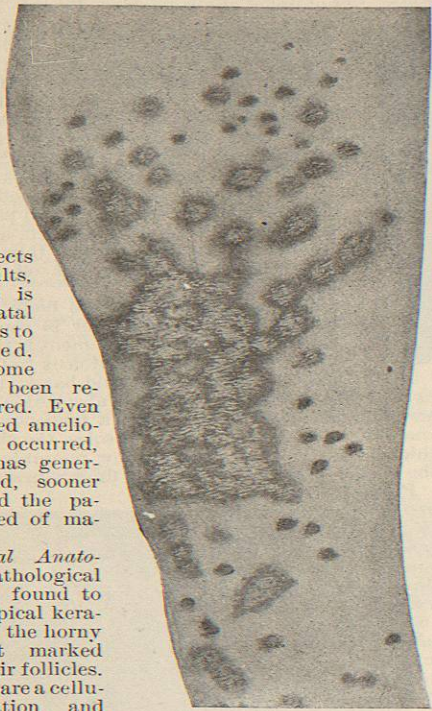


FIG. 3197.—Lichen Planus. (A. R. Robinson.)

calculated to improve the general condition, are indispensable adjuncts to the treatment. Externally, for the generalized eruption, alkaline baths (such as bicarbonate of soda, five ounces to thirty gallons of water); for the patches, oil of Cade (10 to 20 per cent.), pyrogallic acid (10 per cent.), and ammoniated mercury (10 per cent.) are advised. The illustrations accompanying this article are from the collection of Prof. A. R. Robinson, of New York. R. A. McDonnell.

LICHEN SCROFULOSORUM.—(Synonyms: Acne cachecticorum (Hebra, Kaposi), acne scrofulosorum [Cott Fox], folliculitis scrofulosorum [Unna].)

SYMPTOMATOLOGY.—Hebra's original description is one of the few classics in dermatology which have stood the test of time. It runs somewhat as follows. The eruption consists of small, acuminate papules, varying in size from a point which is barely visible to an object the size of a pin's head. They are a bright red in color at first, fading gradually until they differ very little from the surrounding skin in tint. Slight pigmentation is generally left after their disappearance. A minute scale forms on the summit of each papule during involution, the desquamation becoming more prominent as the end approaches. The papules occur in groups, circles, or segments of circles, with little tendency to coalescence. This grouping is due to their localization about the lanugo hair follicles. The life of each papule varies from a few weeks to five or six months, but the tendency to relapse makes the duration of the disease most uncertain. The site of election is the lower part of the trunk, especially along the flanks, spreading from them in rare cases over the whole body on to the neck, the thighs, and upper arms. As a rule, progress is arrested at the axillae and groins. There are no subjective symptoms.

Complications may change the appearance of the skin somewhat. The papules show occasionally a central comedo, which may become pustular, as in true acne. These lesions, which have been known to appear on the face, constitute what has been called the acne of cachectic infants. The skin may show evidence of malnutrition in the form of branny scaling between the papules, punctate follicular hemorrhage, and an eczematoid dermatitis, usually pustular, about the genitals. Not infrequently there is an acroasphyxia. In young children the disease may occur on the limbs without attacking the body. Involvement of the extremities is much more common than in adults, but pustulation, on the other hand, is less frequent.

ETIOLOGY.—Lichen scrofulosorum is a disease of youth; the youngest recorded case was in a child of eleven months, the oldest in a person of thirty years. Males, at least in German lands which furnish by far the largest number of cases, are more subject to it than females. The chief point in its etiology is the relationship to tuberculosis. According to Austrian statistics, over ninety per cent. occur in the tuberculous. Pulmonary disease is not so common a complication as the condition called scrofulosis, evidenced chiefly by lymphadenitis, bone disease, and tuberculous ulcerations of the skin (scrofuloderma). At times no such lesion is discoverable and there is no family history of tuberculosis.

Of recent years much has been written of this and kindred affections, such as erythema induratum scrofulosorum, and the controversy over their etiology has been more or less bitter, not to say personal. One party holds that the appearance of the papules is caused by circulating toxins; the other, that the tubercle bacillus is directly responsible. No one has the hardihood to deny the connection with tuberculosis. Out of a large number of animal inoculations with the tissue, only three have been reported as successful. Jacobi (Congress of German Dermatological Societies, 1892, p. 69) is the only writer who has found the tubercle bacillus in the lesion; Darier, Michelson, and Sack have failed after diligent search. Pelizzari thinks, in spite of his single success in inoculation, that the positive findings indicate only a contamination in a soil prepared by the toxins. Hallopeau

in 1892 announced that injection of tuberculin produced a perifollicular lesion resembling the lichen, and Schwenger and Buzzi (*Monatsh. f. prakt. Derm.*, vol. xi, 1890, p. 581) have confirmed his observation. Jadassohn and the Vienna school, Kaposi at the head, are convinced that the disease is non-bacillary.

HISTOPATHOLOGY.—The lesion is a perifollicular, productive tuberculosis. The cutis shows an irregular formation of miliary tubercle, consisting of exuded elements in the shape of lymphocytes and plasma cells, epithelioid cells derived from fibroblasts and endothelium, and giant cells of the Langhans type with peripherally arranged nuclei. Coagulation necrosis and caseation are common. The new tissue is non-vascular. There may be made out, at times, even in areas of caseation, a delicate reticulum formed of the remains of the elastic fibres. Epithelial changes are secondary. The epidermis loses its interpapillary projections and becomes flattened. It may be slightly thickened and the horny layer may be lost or be partly detached in the form of a scale.

DIAGNOSIS.—Kaposi characteristically put this matter in a nutshell when he said that the diagnostic points were Hebra's original description and its occurrence in the tuberculous. Papular eczema is not limited to the trunk, as is often the case in lichen; in children the lesions are apt to become vesicular; they are of a deeper red and larger, and itching is intense. Follicular syphiloderms may be localized in much the same way as lichen of the scrofulous, but the papules are larger and involve the cutis more deeply. The common type occurs early in the course of syphilis, and careful search will show evidence of other "secondaries"—lymphadenitis, generalized and indurated, mucous patches, alopecia, etc.

Punctate psoriasis is much more generally distributed than the lichen, it occurs on the face and head, its tint is fiery red at the time of its first appearance, and the scales are thick, white, glistening, and moderately adherent. The papules of lichen do not enlarge; the guttate lesions of psoriasis do. In lichen or keratosis pilaris, while the site may be the same, the extensor surfaces of the upper arms and thighs are almost certain to be affected. The hair is surrounded by a horny plug, which is separated with difficulty.

TREATMENT.—Cod-liver oil, externally by inunction and internally, is the only remedy now recommended, because it is perfectly efficacious. It is thoroughly rubbed in and covered with oiled silk. The application is of course objectionable on account of the odor, and if it is impossible to secure the patient's consent, substitutes must be tried. The emulsions all have a slight smell, which becomes more pronounced in contact with the body. In case the repugnance is unconquerable, sweet oil, lanolin, or vaseline may be used in its place, pure or combined with one per cent. of thymol, menthol, or tar in the form of *pix liquida* or oil of cade. The general health requires close attention in every instance.

PROGNOSIS is good as regards the individual attack. Otherwise the outlook is that of the intercurrent tuberculosis which is not influenced by the cutaneous outbreak. If the tuberculosis continues, there is always danger of relapse. James C. Johnston.

LIFE INSURANCE EXAMINATIONS.—Life insurance examinations are made by physicians to determine the fitness of applicants for insurance. The purpose of the procedure is to estimate the expectation of life. It consists in obtaining a complete personal and family record and a knowledge of the present physical and mental condition of the subject. Formerly a certain number of impaired lives, roughly estimated at fifteen per cent., were declined and denied the benefits of insurance. Recently a few companies, revolutionizing the medical aspect of insurance by the ingenious co-operation of the actuary and medical departments, have devised plans for insuring these lives on a sub-standard basis, thus offering forms of insurance to all, or nearly all, in accordance with the expectation of life, and after a careful consideration of the age, occupation, history, and extent of impairment.

The Examiner and His Duties.—The mortality in insurance depends so largely upon the moral character and sound medical judgment of the examiner that the selection of one qualified to discharge these obligations should be most carefully made. He need not be the physician with the largest practice in the community and should not be selected through favoritism. A well-trained hospital graduate, conscientious and willing, will often give the greatest satisfaction. A pleasing personality, promptness as regards keeping of appointments and response to correspondence from the home office, interest, frank expression of opinion, courage of conviction, a kindly feeling toward agents, and a courteous, business-like approach and handling of applicants are requisites to success in the field of life insurance. With the introduction of sub-standard writing the examiner is no longer obliged to decline risks for insurance. In reporting impaired or sub-standard risks the duty of the examiner is merely to state clearly the facts, give full details of family or personal history, and explicitly the extent of the applicant's personal impairment; for the responsibility devolves upon the home office for classification or declination. The qualifications of standard risks—that is, normal lives—are as rigid as ever, and examiners are advised, when they consider an applicant a standard risk to state so clearly, avoiding unnecessary restrictions or otherwise interfering with the home-office estimation. If one will fancy himself in the home office trying to fathom incomplete and unscientific statements, he will readily see how much business may be lost to companies through these causes and from necessary delays in correspondence.

The Applicant.—Experience alone will teach the examiner to appreciate the great difference between the applicant for life insurance and the patient. The latter, when consulting a physician, will willingly, patiently, and honestly disclose everything pertaining to his illness, laying bare all the facts known to him, so that he may be benefited by proper treatment and advice. In the case of an applicant, on the other hand, the physician is often treated with indifference or insult, he is looked upon with antagonism, as an ally of a great corporation, and in many instances the applicant will resort to fraud, to hiding facts, and otherwise making misstatements. The relation between the applicant for insurance and the examiner being then merely one of business, if the applicant can be brought to appreciate this relation many obstacles and difficulties may be removed from the path of the examiner. Applicants often determine not to take out insurance, even after they have signed an application blank and an appointment card. In such a case a few courteous introductory remarks and the expression of interest on the part of the examiner will often induce them to change their minds and submit to examination. Again, applicants will often refuse to sign an application blank until after the home office has expressed an opinion as to their eligibility, but they may be induced to sign by the examiner, who, with tact, may often accomplish what the agent, with all his well-known persistency and persuasion, has failed to do.

Appointments.—Appointments for examination are, as a rule, made by the agent at the request of the applicant and in accordance with his own convenience. The keeping of these is of great importance in large cities where competition is keen and where the business of the applicant will not allow the giving of much time to an insurance examination. The examiner may save himself a great deal of time and trouble by learning, after some experience, when he may or may not call upon applicants at times other than the appointed hours. Positive appointments must be kept in the cases of policemen, firemen, trainmen, bankers, brokers, builders, and those engaged in other exacting businesses. The examiner need not adhere so closely to the request of storekeepers, grocers, bakers, housewives, janitors, and others who have many hours daily during which they may be examined. He will also appreciate the fact that clerks, machinists, carpenters, tradesmen generally, and labor-

ers cannot be seen during the day; they can be examined only at night.

The Application.—The application should be in the hands of the examiner at the time of the examination. In large cities, where applicants are strangers to the examiner, the application serves as the only means of identification, which is effected by a comparison of the signature on the application and the one on the medical blank. This comparison is important, for, apart from the question of identification, the genuineness of the signature prevents legal complications in the event of the questionable death of the insured.

The Written Examination.—The written examination consists in describing as accurately as possible the applicant's personal and family history. The many points are herewith noted:

(1) Occupation. Occupation not only influences the examiner's estimation of the risk, but influences greatly the home office in the matter of acceptance, classification, or declination. The examiner should with care inquire into the duties of a given occupation, especially when the duties may possibly be hazardous. Take, for example, the "laborer." Digging in the street is a fairly healthy occupation, but if the man's work lay in caissons or subways the occupation would then be considered hazardous. The electrician who handles the telephone or low voltage wires is a desirable risk, while the danger to employees in power houses or subways of great street railway companies is greatly increased and makes them less desirable risks.

As regards the examiner's estimation, we may take the musician as an illustration. A cornetist may be expected to have a slight degree of emphysema, but if this is without râles the examiner will display conservative judgment by giving it little or no attention; if, however, such a condition were found in the violinist or pianist, it would be considered due to pathological causes and have a distinct bearing on longevity. In the case of a "liquor dealer," the examiner should learn the number of hours which he spends daily in the saloon and also the length of time which he devotes to the bar.

(2) Age. Relatively few of those who apply for life insurance before or during the period of puberty pass standard examinations. This is due no doubt to functional derangements, such as systolic murmurs at the apex or to the left of the sternum, at the base of the heart, albuminuria due probably to masturbation, or an hereditary predisposition to certain diseases. These often extend through the adolescent period and disappear or are outgrown by the age of maturity. Different ailments are met with more frequently and are more fatal during given periods or ages. For example, respiratory and acute abdominal diseases are encountered between the ages of twenty and thirty years; rheumatism, organic diseases of the heart, acute diseases of the chest, between the ages of forty and fifty years; urinary and degenerative diseases generally, apoplexy, and paralyses, between the ages of fifty and sixty years. The intermediate period—between thirty and forty years—constitutes that in which are found the most desirable lives from the point of view of the insurance examiner.

(3) General appearance. Careful observation of the general appearance will aid the examiner in arriving at a correct estimate of the risk. The facies of tuberculous disease, of cancer, or of renal or hepatic disease may be noted. Due consideration, however, must be allowed applicants of sedentary habits; the clerk, tailor, hatter, and dyer may not have the rugged appearance of the carpenter, mason, blacksmith, sailor, or laborer who is daily exposed to the elements. They are, however, as a rule, fairly desirable risks.

(4) Habits. Intemperance in the use of alcohol or addiction to drugs may readily be detected in the applicant's appearance, breath, pupils, actions, writing, pulse, gait, or urine, or by a tremulousness of the muscles, and in such case the applicant should receive the severest and most decisive action on the part of the examiner, especially so when the applicant is under the influence

of the drug or of alcohol at the time of examination. The examiner must have no sympathy for the applicant, as excess in the use of alcohol or drugs presages and predisposes to rapid dissolution in the event of his contracting an acute disease.

(5) The family history. Many applicants cannot give accurate details of their family record. Care should be exercised, in filling out the blank for the cause of death, to avoid the use of terms, such as "cold," "heart failure," "childbirth," or "change of life." When the term "change of life" is used, the examiner must inquire whether mental or malignant disease (as cancer) existed. When the cause of death is given as "childbirth" and death had occurred within two weeks, it may be inferred to have been due to hemorrhage, septic, cardiac, or renal disease; if, however, three months or more had elapsed between delivery and death, careful questioning on the part of the examiner is imperative, for tuberculous disease so often follows childbirth. When the applicant is markedly over or under weight, a statement regarding the weight of each member of the family is desired.

(6) Personal history of the applicant. The examiner should give as accurate a pen picture as possible of past or present illnesses. Relatively few applicants will confess to syphilis, and, inasmuch as many apply when the manifestations are not noticeable, a diagnosis is most difficult. Care should be exercised in separating the simple, local chancroidal disease from constitutional syphilis. It is advisable for the examiner to obtain, when possible, a description of the initial sore, a statement in regard to the length of time between exposure and the appearance of the sore, details and order of occurrence of the symptoms which followed, the date when the final symptoms appeared and what they were, and an account of the treatment, how long it was continued, and what was the condition of health both during the treatment and subsequently. All these are of importance, as failure to report them impedes the home-office handling of the case.

When the applicant is deformed, lame, or maimed, an exact description is necessary. If deformity of the spine exists, an expression of opinion as to whether it is due to tuberculous disease or not, is desired. Where there is shortening of a limb, the amount should be stated and also the form of apparatus worn should be noted. In the event of diseases such as appendicitis and rheumatism, detail in the report is necessary. In appendicitis, for example, the examiner should note the number of attacks, symptoms, medical or surgical treatment, and result of treatment. A point of especial interest and importance to the home office is a statement whether the appendix had been removed or not. In the case of rheumatism one should state definitely whether it was acute or chronic, the number of attacks, the duration of each, the joints involved, the character of the pain, the amount of swelling, and the results of treatment. The examiner should always state specifically the result in case of any past illness; for example, in the event of absolute recovery, he should write "no ill effects." In many instances the examiner will describe ailments or findings which will not affect longevity. Here he may assist the home office by expression of opinion such as "of no import," "merely mentioned as noticeable," or "has no bearing on longevity."

Care should be taken not to use indefinite terms, such as "shortness of breath," "dropsy," "colic," "fits," "fainting spells" or "vertigo," or "spitting or raising of blood," without detail, as all are but symptoms of more or less serious conditions or diseases. The "shortness of breath" of asthma, which is distinctly a neurosis, with paroxysmal dyspnoea, due to narrowing of the bronchial lumen, must be differentiated from attacks which resemble it, but which are caused by mechanical obstruction to the passage of air, as by pressure, within the thorax, upon the trachea (goitre, aneurisms), and by the presence of growths or foreign bodies in the larynx. On the other hand, the shortness of breath may be associated with cardiac diseases, tuberculous pneumonia, bronchitis, emphysema, and renal disease. The term "dropsy" occurs in so many places in the statements of applicants for life

insurance that special care must be exercised in stating whether it is of renal, respiratory, gastro-intestinal, circulatory, hepatic, or splenic origin. In the case of "colic" it is important to note whether it is stomachic, intestinal, hepatic, renal, ovarian, or uterine, or that due to lead poisoning. Sex, occupation, history, position of pain, and examination of the urine are among the points of importance. The term "fits," as used in the examination blank, is meant to cover such cerebro-spinal neuroses as epilepsy in its several varieties, chorea, and hysteria; also the convulsive movements seen in the course of certain diseases, as in uræmia, renal colic—if the ureters are obstructed,—in tumors of the brain, wounds of the head, and diseases involving the skull.

"Spitting or raising of blood." The determining of the source and cause is at times one of the most difficult and important details which the life insurance examiner is expected to supply. The differentiation between true hæmoptysis, hæmorrhage from the gums, nose, throat, or stomach, demands especial questioning and examination. The appearance of blood, spat or raised, during the course of a severe bronchitis, diseases of the heart, pneumonia, aneurism, or ulcer or cancer of the stomach, will try the examiner severely in arriving at a diagnosis. In many instances it is simply impossible to obtain a perfect history from the applicant, as owing to delicacy or fear he will not disclose the facts. An examination of the chest will often clear the diagnosis, though physical signs may be absent, the disease manifesting itself for the first time by the spitting or raising of blood. Examination of the sputum for detection of the tubercle bacilli may aid, though a single examination may not suffice. If the raising of blood is noted in the course of diseases of the heart or aneurism, or if it come from the gums, nose, or throat, the history and physical examination will suffice for recognition of the source. In the case of hæmatemesis, the presence of ulcer or cancer may be determined by the history, age of the individual, and physical examination.

"Vertigo," "fainting spells," and "dizziness" result from the simplest as well as from the gravest causes. The importance of detail will readily be understood when we remember that the condition is met with in simple eye strain or astigmatism as well as in fatal chronic renal disease. It is noted after sexual excesses, in neurasthenia, leukæmia, diseases of the external, middle, or internal ear, in stomachic or intestinal dyspepsia, in disorders of the liver, in neuroses such as migraine, and in the immoderate use of tobacco, tea (prepared improperly), coffee, or alcohol; and it occurs with greater severity in cases of tumor of the brain, of fatty heart, of cardio-vascular neuroses, and of arterio-sclerosis, as seen in the aged.

The Examination.—After he has furnished a thoroughly written report of the candidate's past history, the examiner is expected to make a complete physical examination. This examination should be conducted in a quiet place, and the applicant should be observed (for many reasons) while standing. The examiner is advised to go over every case in the same way, without reference to the amount of insurance applied for. The home office will readily detect bungling, half-hearted, and unscientific work on the part of the examiner, and it will not reflect to his credit. The first steps of the physical examination consist in obtaining the pulse while the applicant is seated and before he has been subjected to anything that is likely to excite the heart's action. The pulse will be found a valuable aid to the examiner in his diagnosis. Character, rhythm, and rate should be carefully observed, especially while the applicant is seated. If there is any irregularity of the pulse, without organic lesion, and the subject is apparently a normal person, he should be questioned as to overindulgence in alcohol, tea, coffee, or tobacco. The weight, as a rule, must be estimated, as scales are rarely at hand. Measurements of the chest and abdomen should be made over the shirt. The height is usually estimated by a tape from a mark on the wall, corresponding to the level of the applicant's head, to the floor; as an expedient, however, I would suggest the

determination by tape of the difference between the applicant's and the examiner's known height on the wall. For example: Suppose the examiner's height is 6' 0", and that of the applicant 5' 5", the difference on the wall of seven inches would give the exact height, 5' 5".

Every physician has his own method of examining the chest. Experience in making examinations for life insurance in a large city has taught me to depend almost entirely upon the ear in examining the chest. I resort to percussion only after auscultation has revealed the existence of some abnormal condition of the chest. While examination of the lungs may be made through many thicknesses of underclothing I invariably request the applicant to turn up his shirt when it becomes necessary to examine the heart. This not only allows the application of the stethoscope but also permits inspection of the chest and abdomen, palpation, and percussion if necessary, and reveals the appearance of the skin (color and existence of skin disease). Few, if any, applicants will refuse to comply with the request to turn up their shirts if this is made at the end of the examination, while many will refuse if asked at the beginning. Tact is needed here as well as at other times. If the examiner proceeds carefully and cautiously the applicants will grant any reasonable demand.

The Physical Examination of the Chest. The physician may proceed, as is his custom, by auscultation of the entire chest. All cases in which râles are found—except those which are recognized as being of a chronic character, or those in which the râles accompany emphysema—should be re-examined within two weeks. Few, if any, conditions are met with more frequently than bronchitis. When there is found a localized change in the respiratory note, increased fremitus and voice sounds, associated with moist râles, the case must necessarily be looked upon with suspicion. When re-examination is necessary, the examiner should assure the applicant that it is the usual procedure. Tuberculosis of the lung is rarely met with by the examiner except in its incipency, for those in the advanced stages seldom apply for insurance. The medical examiner should therefore always be on his guard against overlooking the first evidences of this disease. If he trusts to the physical examination alone, in deciding this question, he is likely to reject many applicants who do not deserve the stigma. This difficulty may be overcome in time by the use of methods employed in private practice—namely, the microscopic examination for the tubercle bacilli. If possible, one should make all re-examinations in the afternoon, preferably between five and six o'clock, especially in those cases in which tuberculosis is suspected. The examiner will find his clinical thermometer a valuable aid in these cases.

In a case of emphysema, it is desirable to state whether there are râles present or not. The condition is most often noted in bakers, confectioners, butchers, and musicians (wind instruments).

The Heart.—We must appreciate that the existence of a murmur does not necessarily indicate organic heart disease; also that lesions may exist without the constant production of a murmur, except that heard with diastole, at the base, which is constant. This depends entirely upon the heart muscle and the degree of compensation present. The blowing sound heard below the subclavian is of little importance; it is most often observed in the anæmic. Many of the soft-blowing systolic murmurs heard mostly over the base of the heart in the pulmonic area, and occasionally at the apex, are hæmic. Furthermore, in applicants over fifty years of age, when a harsh, whistling, systolic murmur is heard over the aortic area, it indicates, in a great majority of cases, atheroma of the aorta, not a disease of the valves. When reporting lesions of the heart, it is desirable to give as full an account as possible. Experience has shown that the expectation of life is not the same for the different varieties of heart disorder; that it varies greatly according to the valve involved and the extent of compensatory hypertrophy or dilatation. This may readily be indicated by using a chart such as that here shown. In this particular in-

stance, the findings, which are noted on the chart (Fig. 3198), are those of a case of mitral regurgitation with a moderate degree of hypertrophy.

After the examination, which should not require more than from fifteen to thirty minutes to complete (depending on the length of the medical blank and the skill of

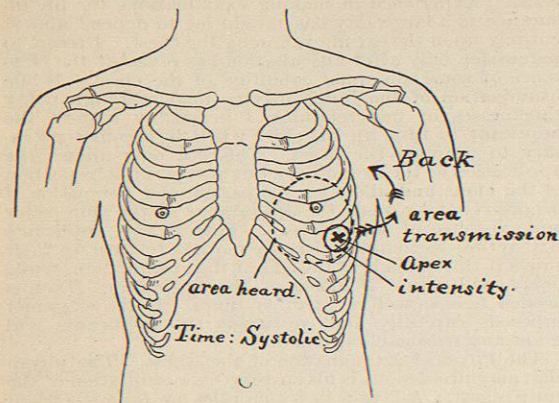


Fig. 3198.—Convenient Form of Chart for Recording Data relating to Heart Murmurs.

the examiner), lengthy discussion or expression of opinion as to the applicant's condition should be avoided. The simple statement, "I am unable to tell you what is the result of the examination until after the urine tests shall have been made," will make the applicant understand that the examiner is not ready to commit himself. Agents complain they have great trouble in placing standard policies after examiners have told the applicants, before the examination of the urine, that they are physically perfect, for then they fully expect first-class policies.

Examination of the Urine.—Under ordinary circumstances the only examination required in regular routine by the majority of life-insurance companies is the determination of the specific gravity, the reaction, and the presence or absence of albumin and of sugar. Some companies even omit the examination for sugar unless the specific gravity is suspiciously high. Microscopical examination is required variously by the different companies in ordinary routine, the requirement being determined either by the consideration of age of the subject or amount of insurance on the life. Such an examination, however, is ordinarily expected when from conditions peculiar to the case, such as the finding of albumin or of a sediment in the urine, it would naturally suggest itself.

Urinary examination other than the foregoing is at the discretion of the examiner or at the call of the insurance company, according to the circumstances of the case.

Methods, in the examination of urine for life insurance, are, of course, the same as in a corresponding examination for clinical inquiries, and for them the reader is referred to the article on *Urine*. The only special point in the ordinary routine examination for life insurance is that by the conditions of such examination the examiner is not expected to examine other than the sample of urine procurable at the time of examination. It would, of course, be desirable to examine from the collected urine of a day's voiding, but such procedure is ordinarily impracticable.

The urine should be obtained in a small wide-mouthed bottle, and it should be passed in every instance, if possible, in the presence of the examiner. An ingenious precaution against the mixing of specimens may be found in the use of bottles with ground glass fronts. The name may then be written on each bottle. Fraudulent substitu-

tion is possible, especially by women, owing to the privacy demanded in their case. The examiner should be suspicious of every individual, and if he cannot have the urine voided in his presence, he should endeavor in other ways to be certain that it has been passed by the applicant. He should grasp the bottle when handed to him in order to determine by the warmth whether it is fresh or not.

As the next step, he should note the color of the urine. In health this varies from a pale straw to a deep amber. It may be altered by the presence of bile or blood or by the ingestion of certain drugs as rhubarb, creosote, turpentine, etc. The urine of hysterical persons is pale. It is also light-colored in diabetes and after the ingestion of large quantities of water or beer. Various substances may give the freshly voided urine a turbid appearance. Among them may be mentioned mucus and epithelia, earthy phosphates of calcium and magnesium, the urates of calcium, magnesium, sodium, and potassium, and, finally, blood or pus. When urine has been allowed to stand for a certain length of time, it is apt to become turbid through the decomposition caused by bacteria. The phosphates, if amorphous, may be dissolved by the addition of nitric or acetic acid after the application of heat; but the heat may at first increase the opacity. Heat alone dissolves the urates. If the urine remains opaque after the application of heat and the addition of nitric acid, this fact indicates the presence of albumin and the microscope must be resorted to in order to determine the exact cause.

The specific gravity of normal urine varies from 1.015 to 1.025. The urinometer may be used with advantage after the analysis rather than before, so that the examiner may not in any wise be influenced by its reading. The specific gravity is increased in diabetes mellitus, in the first stage of acute fevers and of nephritis, and when blood is in the urine. It is decreased in chronic nephritis and in hysteria. In some instances I have found sugar in urine of which the specific gravity was as low as 1.010.

When first voided the urine of healthy persons is slightly acid. After it has stood for several hours, especially in warm or stormy weather, fermentation is likely to take place, thus rendering it unfit for examination. The odor is then ammoniacal, and the appearance is turbid. Filtration should be practised in every case of turbid urine to aid in rendering it clear; filtered urine should never, however, be saved for microscopical examination.

To determine the presence of the abnormal constituents, albumin and sugar, many methods have been devised. A few of the most simple and satisfactory are herewith described.

Albumin.—For the detection of albumin in urines of 1.015 specific gravity, or lower, the heat and acid test is the best. This may be performed as follows: Fill a small test tube one-half with clear urine, heat the upper one-third until it boils. If turbidity results, it is due to the presence of either earthy phosphates or albumin. If it is due to the former, it will disappear on the addition of a few drops of acetic or nitric acid. If, however, the turbidity does not disappear, but increases on the addition of acid, it denotes the presence of albumin. In urines of specific gravity of 1.015 or over the Heller or contact test will be found the most satisfactory. The method is as follows: Pour a small quantity of pure, colorless nitric acid into a small test tube, incline the tube and allow the urine to run slowly from a pipette (with a rubber bulb at one end) down on the acid, the urine overlying the acid. If albumin be present, there will appear at the line of contact a white band or zone. There may appear a zone of haziness, not at the point of contact, but higher, in the urine. This is composed either of mixed urates or of crystals of urea nitrate, which are dissipated by the application of heat to the urine; or it may consist of mucus, which is not affected by the application of heat. Resins ingested will produce a peculiar, dirty yellowish zone at the line of contact. This has none of the appearances of albumin and is dissolved by the addition of pure alcohol.

Sugar.—The two tests used for determining the pres-

ence of glucose are Fehling's and the phenyl hydrazin. Fehling's solution is prepared by dissolving 34.65 gm. pure crystallized sulphate of copper in 200 gm. distilled water; 173 gm. chemically pure crystallized neutral sodic tartrate are then dissolved in 480 gm. solution of caustic soda of specific gravity 1.14, and into this basic solution the copper solution is poured, a little at a time. The clear mixed fluid is diluted to 1,000 c.c., or the cupric sulphate may be dissolved in 500 c.c., the tartrate salt and potash solution being diluted to 500 c.c.; and then the two solutions are to be kept in separate bottles to be used when a test is desired. The test is made as follows: Take 1 c.c. Fehling's solution, boil; if the solution remains clear add, drop by drop, urine from a pipette and heat; if sugar is present, a yellowish precipitate of copper suboxide will be thrown down, changing to a reddish-brown. Care must be taken not to mistake the flocculent deposit of earthy phosphates for the suboxide. Uric acid, when concentrated, gives a reaction somewhat similar to that of the earthy phosphates. These, however, have none of the characteristics of the suboxide reaction. The phenyl hydrazin test is somewhat more complicated and therefore not so well adapted for the present purposes. For a detailed account of this test the reader is referred to the article on *Urine*.

Microscopic Examination of Urinary Sediments.—When albumin is found in the urine the examiner must determine, by the microscope alone, the cause, as, in the classification of applicants, the albuminuria of nephritis, the pathological albuminuria, must be differentiated from the functional, accidental, or spurious albuminuria. The latter is due in many instances to the presence of semen, of blood, or of pus in the urine. Pathological albumin may be said to be due to (1) disturbances in the circulation; (2) changes in the composition of blood; (3) changes in the epithelia of the kidney. That the differentiation is important may readily be seen in the injustice which results from assigning to a simple or chronic cystitis (non-tuberculous), urethritis, etc., the same degree of objectionableness as to some form of actual renal disease. Examiners for life insurance companies, and especially those who live in the larger cities, would find it advantageous to possess a centrifuge, as haste is demanded in finishing and reporting cases. This is not the proper place for a discussion of the data by means of which this differentiation can be made. The reader will have to obtain this information in part from the article on the urine, and in part from the various articles which treat of diseases of the kidney, ureter, and bladder.

Abbott Smith Payn.

LIGATURES. See *Dressings, Surgical*.

LIGHT, THERAPEUTIC USES OF. See *Roentgen Ray, The Use of*.

LIGNOSULFIT is a brown liquid obtained as a by-product in Kellner's method of manufacturing cellulose. It consists of sulphurous acid and aromatic compounds which Simon says are those of the fir. For use in tuberculosis, a ten-per-cent. aqueous solution is allowed to saturate the air of a room in which the patient remains for from one to two hours a day. Simon reports decided improvement in the comfort of the patient and in the pulmonary signs.

W. A. Bastedo.

LILY OF THE VALLEY.—**CONVALLARIA.** "The rhizome and roots of *Convallaria majalis* L. (fam. *Liliaceae*)" (U. S. P.). This familiar and favorite little flowering plant, a native of many parts of the northern hemisphere, and everywhere cultivated, has been on the list of medicines and in the pharmacopœias for generations, but had become about obsolete until a few years ago, when its diuretic power and its influence over the heart suggested its employment as a substitute for digitalis. Its flowers and rhizomes have both been used, and possess similar properties, but practice is now almost entirely confined to the latter, which is thus described by the Pharmacopœia: "Of horizontal growth and somewhat

branched, about 3 mm. thick, cylindrical, wrinkled, whitish, marked with few circular scars; at the annulate joint with about eight or ten long, thin roots, fracture somewhat fibrous, white; odor peculiar, pleasant; taste sweetish, bitter, and somewhat acid."

The peculiar constituents of lily of the valley are *convallarin*, a purging crystalline substance, and *convallamarin*, a bitter, half-crystalline whitish powder; both are glucosides, the former decomposing into convallaretin, and the latter into convallamaretin. Convallamarin is a rather active poison of the digitalis character, in small doses increasing the urine and strengthening the heart's action. Although less reliable and useful in cardiac weakness than digitalis, it is still worth remembering when that drug acts unkindly, or when, after taking it for a long time, it is desirable to change for a while.

Convallaria may be given in substance. Dose, about 1 gm. (gr. xv.), or one may prescribe, as is more commonly done, the same number of minims of the official fluid extract. The conditions which indicate the use of this remedy are the same as those which call for the employment of digitalis.

W. P. Bolles.

LILY, WATER. See *Nymphœacea*.

LIMBS, ARTIFICIAL.—Artificial limbs are designed to take the place of the natural members when the latter are lacking either from congenital defect, or from surgical operation, or from traumatism. Deformities are corrected, and to some extent function is restored, by these appliances.

Lower Extremity.—The making of artificial limbs is a comparatively modern industry. Prior to the sixteenth century any one so unfortunate as to lose a limb had to depend upon the services of some ingenious friend or mechanic (carpenter or blacksmith) for such substitute as could be obtained. The productions of this period were for locomotion only, and made no pretence to conceal the loss of the limb. From this time to the end of the eighteenth century little progress was made; although in the writings of the celebrated Ambroise Paré (1509 to 1590) we find mention of an elaborate and ingenious leg, with joints at both knee and ankle; and, about a century later, the Dutch surgeon Verduin constructed an artificial leg for an amputation below the knee. This appliance consisted of a wooden foot connected by strips of steel to a copper socket lined with leather; this socket received the stump, and the weight of the body was supported, not on the flexed knee, but by lateral pressure on the stump and thigh. The productions of a Paré and a Verduin were for the few, not for the masses; and were heavy, intricate, and clumsy compared with modern appliances. At the beginning of the last century an impetus was given to the construction of artificial limbs by the Napoleonic wars; whatever claims to glory Napoleon may have, he certainly made many cripples and should be hailed as the patron saint of prosthetists. In the battle of Waterloo, the Earl of Uxbridge (afterwards Marquis of Anglesey) lost a leg, and a wooden one was made for him by Pott. This was the famous "Anglesey leg" which for a long time represented the highest prosthetic art, and was the pattern for many that followed; it was subsequently modified by Selpo and Palmer, and as such may be regarded as the "leg" on which the American prosthetic industry stands. The Anglesey leg consisted of a bucket or socket of wood to receive the stump, a steel joint for the knee, and a wooden joint for the ankle; this latter was moved by a spiral spring anteriorly, and by catgut cords posteriorly.

The Civil War may be taken as the starting-point of the modern prosthetic industry. The countless mutilations suffered at this time, and the liberality of the United States Government in providing the sufferers with artificial limbs, have brought out the ingenuity of several American prosthetists, and it is no exaggeration to say that in this branch of industry the Americans lead the world. But peace and the arts of civilization, such as the steam engine, the electric motor, the factory and