If we do not abstain from these things ourselves, we cannot consistently deplore them in others. But I was about to omit one of the most excellent things that I have heard in my entire life. Not long ago I had occasion to be at our insane hospital, and the chief man said to me: "Doctor, I have been thinking for some time that I would call the attention of the association to a thing that has impressed me very greatly here at this institution. We have found that wherever a doctor has become a habitue of the narcotics, that this institution could with a map locate that doctor by the increased number of patients that are sent into this institution from around that doctor's place of abode." Think of that, gentlemen. There you are. This doctor uses morphine. This doctor uses cocaine. This doctor uses liquor. The records at the hospital down there show that around his home an increased number of patients come to that hospital to be treated for drug habits.

Does this statement not argue that we, the sanitarians of the State, should get busy at housecleaning, and see to it that these disseminators of these habits are effectually suppressed? This should be done by revoking their licenses to practice medicine.

Dr. Griffin: I want to say just another word or two. The gentleman over there in the corner said that somebody had said it would increase insanity. I was the man that made that statement, but I got it from the superintendent of the insane hospital this afternoon. He says that insanity is increasing in the State of Alabama, and that caffeine and tobacco had a great deal to do with it. Tobacco is not a drug; it is put down in the *materia medica* as a poison. It is not a drug at all.

NON-TECHNICAL DIFFERENTIATION OF CARDIAC ARRHYTHMIAS.

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There is no doubt that a great deal of interest attaches to methods of studying cardiac movements by precise graphic methods. The question arises, however, as to whether the use of the sphygmograph is essential to the proper diagnosis and understanding of the arrhythmias by the busy general practitioner and internist. Thomas Lewis in his classic

manual* states in effect that the graphic method entails more skill and experience, time and energy than the general practitioner can afford to cultivate and spend. Moreover, he states, and this is the fundamental point, that most disturbances of the heart's mechanism which are met with in everyday practice can be identified by simpler means. With these opinions the majority of cardiographers would probably concur.

The development of the graphic method has contributed not a little to the original differentiation and classification of disorders of the heart largely because of the permanency and visualization of the records; but it has likewise contributed to the discovery of simpler means of identification. Granting this to be so there will always remain a small number of types of arrhythmia whose absolute recognition will only be possible by means of graphic methods, that is to say, by the use of sphygmographic and electrographic means.

The following paper is an attempt to briefly describe the non-technical signs, chiefly objective, a careful attention to which will enable the practitioner to diagnose the different varieties of cardiac irregularity:

There are seven recognized types of arrhythmia. 1 Sinus arrhythmia. 2 Heart Block. 3 Premature Contractions (extra systole). 4 Paroxysmal Tachycardia. 5 Auricular Fibrillation. 6 Auricular flutter. 7 Pulsus Alternans. A pulse which is irregular must be one or a combination of these.

I. Sinus Arrhythmia. This is an irregularity produced by vagal disturbances in the pacemaker or sino-auricular node. Irregularities of the heart beat or pulse discovered in young people are in most instances examples of this disorder. If the patient is below ten years the rule is almost absolute. The point which enables sinus arrhythmia to be recognized with ease outside of age is the fact that the irregularity is found to be connected with and as a

*Clinical Disorders of the Heart Beat. Lond., 1912, iv.

fact, dependent upon respiration. The pulse quickens with inspiration or when the chest is expanded and slows during expiration or when the chest is contracted. Sinus arrhythmia means very little and is not treated.

II. Heart Block. In heart block there is a delay in, or an absence of the passage of impulses from the auricle through the conducting system into the ventricle. In the first instance it is called partial in the second complete heart block. Heart block has chiefly to be differentiated from premature contraction. The easiest form of heart block to recognize is one form of the partial variety known as the single dropped beat. In feeling a pulse which is generally regular a beat will occasionally miss and this will produce the effect of a longer than normal pause. Such an irregularity must be either block or premature contraction. There is an easy way to determine which it is. Listen to the heart with the stethoscope and simultaneously feel the pulse. If the pause in the pulse coincides with a pause in the heart sounds, block is present. The length of the pause may be equal to two normal beats but it is usually distinctly less. If during the pulse pause an extra sound is heard at the apex (not transmitted to the pulse) premature contraction is present.

Another form of partial heart block quite easy to recognize is the so-called 2 to 1 block. Here the auricle beats twice to the ventricle once, only alternate impulses getting through the auriculo-ventricular bundle. Any ventricle found stethoscopically to be beating regularly 40-50 to the minute should be suspected 2 to 1 block. Also if the ventricular rate upon stethoscopic examination is suddenly found to become just half what it was counted immediately before, 2 to 1 block may be asserted to be present. Where 2 to 1 block is present in mitral stenosis two thrills may at times be felt and two diastolic murmurs heard with each ventricular cycle because the auricle contracts twice, the ventricle once.

In complete heart block or dissociation as it

is called the ventricular rate is exceedingly slow. Rates below 40 or 35 are almost certainly block. The rhythm is regular. The first and second heart sounds are modified from beat to beat. The first sound is weaker than stronger and the first or second sounds are reduplicated. Muffled sounds may be heard occasionally in the long diastoles (auricles contracting.) Small and relatively frequent contractions of the veins in the neck will be seen due to auricular contractions; occasionally a prominent venous pulsation accompanies an intensified first sound produced by coincidence of auricle and ventricle contraction. The venous pulse in the neck may periodically wax and wane without any connection with the breathing. Adam Stokes syndrome (syncope) occasionally occurs in complete heart block.

In early or mild forms of heart block there may be only a slowing of the passage of impulses from the auricle through the bundle to the ventricle. This early manifestation is known to the graphists as widening of the As-Vs interval and unfortunately cannot be positively diagnosed by non-instrumental means alone.

Reduplication of the first sound and doubling of the second are often noted. With a regular pulse, apical thrills or rough murmurs in mid-diastole are often due to block occurring with mitral stenosis.

Partial heart block should always be looked for when large doses of digitalis are being given over a long period. Heart block is a serious form of arrhythmia. If digitalis is being given it should be stopped.

III. Premature Contraction. Often called Extra Systole. Here the heart responds to abnormally timed impulses occurring before the regular time. These precarious or premature impulses may originate in the auricular or ventricular portion of the conducting system.

Premature contraction is a very frequently observed variety of arrhythmia, so that it should be always borne in mind and looked for.

The two varieties of arrhythmia with which it may occasionally be mistaken are heart block and auricular fibrillation, particularly the former.

Premature contraction is very much more frequent than block. As previously mentioned solitary pulse intermittences are either premature contraction or block. Judging from frequency of occurrence any particular instance is more likely the former. But the exact differentiation is simple. If the pulse intermits the heart should be examined stethoscopically. Here the premature beat is heard and often felt. In block the heart is silent and motionless during the pause. The sounds that are heard on auscultation will, of course, depend on whether the extra contraction has been strong enough to open the aortic valves.

Whether an occasional premature beat is ventricular or auricular in origin is not of great importance, and can only be told positively by taking a strip of radial pulse on the sphygmograph.

So-called coupled and trippled apex beats and coupled and triple pulse beats, the latter known as pulses bigeminus and trigeminus, are occasionally met with. The mechanism is usually premature contraction, though more rarely may be due to block. The absolute differentiation can only be made by sphygmography.

Premature contractions are frequently the cause of so-called "palpitation." They are of relatively insignificant import.

IV. Paroxysmal Tachycardia. In this variety of arrhythmia there is an abrupt acceleration of the regular heart beat finally terminating equally abruptly in normal rhythm. The rapid heart contractions are produced by new rhythmic but pathological impulses.

An adult whose pulse suddenly becomes rapid, beating at a regular rate of 150 or more, is almost certainly suffering from paroxysmal tachycardia. Lying down does not slow the rate. There may be visible and palpable pulsation in the neck. The counts should

be made with the stethoscope as the pulse is unreliable because of its rapidity. The heart beats are tic tac or embryocardial in character. There is no satisfactory treatment of the paroxysm.

V. Auricular Fibrillation. In this condition impulses arise at multiple foci in the auricle and co-ordinate contraction is lost. Instead of the muscle contracting as a whole, the separate fibrils undergo irregular contraction.

Auricular fibrillation when well marked is very easy to recognize. The pulse is grossly irregular, strong and weak pulsations are jumbled together in hopeless confusion, quick runs of almost imperceptible beats are felt, the pause between the beats is constantly varying.

The heart beats rapidly as a rule and the more rapid the rate the more disordered is the rhythm. Listening over the apex with the stethoscope the disordered rhythm is quite characteristic.

When the ventricle beats irregularly at a rate of more than 120 beats to the minute the condition is almost always fibrillation.

In almost all cases of heart failure from any cause where the rate is much accelerated and the rhythm irregular, the auricles are fibrillating. The effects of exercise upon auricular fibrillation are interesting and instructive from the standpoint of differential diagnosis. Moderate exercise of course will augment the ventricular rate no matter what arrhythmia is present, just as it does under normal circumstances. But a very important difference appears in a given case of irregularity depending upon the nature of the arrhythmia. In fibrillation the pulse becomes more disordered than before as a result of exercise, while the other two varieties of irregularity with which it might be confused, premature contractions and partial heart block, tend to become steadier and less disordered. As the effects of exercise wear off the opposite prevails; fibrillation diminishes block and extra systoles increase. Fever augments fibrillation. Finally it must be remembered that fibrillation is a per-

manent condition, the rhythm itself never completely disappearing after it is once developed. Other irregularities are only occasional in their appearance. The symptoms of heart failure which always accompany exacerbations of auricular fibrillation are almost always curable by digitalis and it is to its specific organotropic effects in this condition that digitalis owes its well-merited reputation.

VI. Auricular Flutter. This is a condition lately discovered and described by Lewis, of London, in which the auricles contract with extreme rapidity sometimes fast as 300 to 400 to the minute. The contractions are regular and not fibrillary. This arrhythmia is rather rare and unfortunately cannot be diagnosed without the electro-cardiograph. The condition gives rise to symptoms of heart failure, and on the administration of digitalis passes into auricular fibrillation so that it is therefore quite amenable to treatment by that drug.

VII. Pulsus Alternans. In this arrhythmia there is an alternation in the size of the pulse beats, or rather in the strength of the ventricular contractions, but it must be admitted that it cannot be recognized without the sphygmograph except in unusual cases. This is unfortunate, because it is of extreme importance to be able to recognize it. All cases of angina pectoris and high blood pressure with cardio renal disease should be searched for it. Likewise old people with premature contractions may have it. All such cases should have pulse tracings, as we know no simple way by which the condition may be recognized.

Lewis says that the symptom pulsus alternans "ranks with subsultus tendinum, optic neuritis and risus sardonicus as ill-omined messengers. It is the faint cry of an anguished and fast-failing muscle which when it comes all should strain to hear it, for it is not long repeated. A few months, a few years at most, and the end comes." It is unfortunate indeed that we have no simple means of finding it.

DEFECTIVE METABOLISM AND ITS RESULTS.*

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In the storehouse of knowledge there are weapons for every defense. Investigators in the great domain of scientific research have evolved truths, or scientific facts which furnish keys to every branch of knowledge. The physician of today, supported by scientific truths which are within the reach of all, safeguarded by individual experience and personal observation, can understand phenomena and perform deeds of daring, accomplish feats that work for man's emancipation from disease that would have been thought impossible a decade ago.

We are living in an age when it is one's right to live, and live so as to enjoy to the fullest the pleasures, the joys, which life and environment afford us. Safeguarded as we are with all the advantage which science and research has afforded us, is it not passing strange that man will not predicate his life upon a higher plane of action and of right living, direct his manner of living in accordance with the established laws of health as is indicated by scientific truths which best safeguards the individual from physical, moral and mental degeneracy? Scientific truths well established, certainly indicate to every one the way in which he can best safeguard the individual, as well as the public, from disease, sickness and death.

Science after having devoted herself through many lonely years to the verification of symptoms, to the research of organic lesions, to the study of pathological physiology, comes at last to study the origin of disease. While the causes are innumerable, they are really reduced to three or four classes, primary ele-

*Read before the Medical Association of the State of Alabama at Montgomery, April, 1914.