the vagus (Mackenzie's "youthful type") may sometimes be differentiated from that due to auricular extrasystoles by the fact that, though there is a pause bearing no relation to the rhythm of the heart, this pause is not preceded by a premature beat or sound.

We have also attempted to differentiate from inspection between the normal venous pulse and that of tricuspid insufficiency. It is often impossible to determine with the eye whether a filling of the vein occurs during systole of the ventricle or just before it, so an attempt was made to adopt a criterion which it has since been learned has been sometimes found useful by Dr. G. A. Gibson of Edinburgh. The normal jugular pulsation shows, as stated above, two fillings of the vein and two collapses for each beat in the carotid. The typical pulsation in tricuspid insufficiency consists of a single filling of the vein and a single collapse for each carotid cycle; so that it has become customary in the wards to speak of them as the "double" and "single" types of venous pulse. In most cases this criterion suffices for the diagnosis of tricuspid insufficiency (subsequently borne out by the physical findings and autopsy), but there are some notable exceptions to this rule.

1. In cases where secondary elevations appeared in the venous pulse during the systolic phase, tricuspid insufficiency being present. 2. In those normal cases where, owing to the small amount of collapse occurring during the systolic period, only one venous wave could be seen with each carotid cycle.

These ambiguities were always readily cleared up by careful measurement of the tracings obtained. The clinical observations were, moreover, corroborated by other members of the medical staff.¹²

Hence it would appear that, although inspection of the venous pulse may frequently yield valuable information as to the disturbance of cardiac function, it is subject to grave errors, not less serious than those incurred by omitting the use of apparatus in determining blood pressure or of the thermometer for temperature. Heart-block, partial or complete, is a condition of too somber significance to justify physicians in failing to control their observations from inspection by the use of more accurate methods—the venous pulse tracing.¹³

VISUAL METHODS IN DIAGNOSIS OF HEART-BLOCK.

II. A REPLY.

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In availing myself of the opportunity of making a rejoinder to Dr. Hirschfelder's criticism of my recent communication I wish first to say that I think his criticism is partly right and

partly wrong. The diagnosis of complete heart-block with the auricle beating four or five times as fast as the ventricle can undoubtedly, as he says, be made without instruments of any kind. In partial heart-block, however, which probably always precedes the complete form, the problem is entirely different. We may not have bradycardia in these cases, but only an irregularity caused by an occasional "block" of the auricular impulse. These cases, the recognition of which is so important, can scarcely be detected without the aid of suitable instruments. It might, of course, be possible in favorable cases to feel an omission of the radial pulse or apex beat and see that a conspicuous venous pulsation continued without interruption. This could only be due to a "block" of that particular auricular impulse, and would point to incipient heart-block.

With a trained and capable physiologic investigator like Dr. Hirschfelder such observations might be quite reliable, but the dangerous fallacy which underlies the routine clinical attempt to determine the time relations of cardiovascular events by inspection and palpation is forcibly illustrated by the history of the now exploded theory of the delay of the radial pulse in aortic regurgitation. Such men as Flint, Balfour and Broadbent taught the correctness of this theory, Balfour stating⁴ that "this delay in aortic reflex is invariable." Graphic tracings made in many cases of aortic regurgitation by Mackenzie have shown that there is not the slightest delay beyond the usual physiologic period, and his observations were corroborated, or anticipated rather, without his knowledge by Francois-Franck and Keyt. It undoubtedly does not occur.

When the left ventricle contracts in cases of aortic regurgitation there is a continuous column of blood from the distended ventricle to the radial artery in a closed tube of normal size, and the column must move without delay and the radial pulse be produced, as we now know it to be, at once; and yet Balfour, an able acute clinician, said that the delay might be "so great that the radial pulse coincides with the ventricular systole immediately succeeding that which has produced it." What a comment this bit of history is on the correct interpretation of such events by the unaided senses! I do not wish to underestimate the value of the highly trained eye, ear and finger, and I think that one of the greatest benefits of the graphic methods will be to enable the clinician to educate those senses in a school of precision heretofore unattainable. He will learn by unimpeachable demonstration just what certain sensations mean, and will be able to interpret them as never before. So I would urge inspection and palpation in the study of cardiac disease with greater ardor than ever, checked and guided by the graphic methods.

What are the advantages offered by this "visual method over simply watching the pulsation of the jugular vein while feeling the pulse in the carotid with the finger"? The facts above cited concerning the retardation of the pulse in aortic regurgitation show how misleading the direct observation of these phenomena may be. It seems to me that a comparison of two parallel levers, especially designed for inspection, simplifies the matter very much. They present a broad surface instead of the narrow-pointed ends of the writing lever. They are much longer than the writing levers on Dr. Hirschfelder's modification of Erlanger's sphygmomanometer which he has been observing with the same end in view, and, therefore, have much greater amplitude of motion. That the observation and comparison of such levers can be more easily and more accurately made than observation of the venous and palpation of the carotid pulses seems to me clear; but whether these advantages are sufficient to justify the multiplication of instruments already burdensomely numerous may easily be questioned. If it could be regarded as a finality in the instrumental study of auriculo-ventricular relations it would be different; but, as clearly stated in my former communication, such is not the case. For instance, a lengthening of the a-c interval (i. e., the interval between the auricular systole and the carotid pulse) is important, even in the absence of any irregularity of the ventricle, as showing a probable impairment of the conductivity of the bundle of His. This could be recognized in exceptional cases if well marked by watching the motions of the levers from the venous pulse and the apex beat, when the

12. Preble: (Insufficiency of the Tricuspid Valve in the Course of Pernicious Anemia, American Jour. of Med. Sci., 1906, cxxxi 393) reports the finding of tricuspid insufficiency in cases of marked anemia, as had also v. Leube. Neither of these writers supported their findings by tracings from the veins, nor mention having made any. Many years before this Potain (La Clinique médicale de la Charité, 1894) had shown by tracings that no real tricuspid insufficiency was present in this group of cases. This observation of Potain is also confirmed by the recent and very careful work of H. E. Hering (Deutsch. med. Wochschr., 1906, 1). In those cases of marked and of pernicious anemia which have come under my observation no tricuspid insufficiency has been present. In one case the venous pulse was of the "single" type, but tracing showed that the collapse occurred during systole of the ventricle. In face of this evidence the observations of Preble and Leube require confirmation.

13. As I have stated elsewhere (see footnote 1 and also Observations on Paroxysmal Tachycardia, Bull., Johns Hopkins Hosp., 1906, xvii, 337) two kinds of partial heart-block are to be distinguished; the organic heart-block, due to lesion in the course of the His' atrio-ventricular bundle; and the failure of ventricle to follow all the impulses from the auricle, due to overaction of the vagus. The former type is always to be regarded as a forerunner of complete block (cf. Erlanger and Hirschfelder: Further Studies on the Physiology of Heart-Block in Mammals, Amer. Jour. Physiol., 1906, xv, 153). The second type can be differentiated from the first only by means of atropin, or some other drug which paralyzes the vagus.

latter can be utilized, which is not rarely impossible. It would, however, be uncertain and unreliable, while with simultaneous tracings the precise interval can be measured with perfect accuracy. I use the Mackenzie polygraph in practically every case, and consider the graphic tracings so essential to accurate diagnosis that I would deeply regret if any one should on my recommendation forego these for a method which, while it has a value, is limited in its application and falls short of the requirements of scientific accuracy. It was only intended to serve as a means of prolonged observation of arterial and venous pulsation, and, especially when the apex beat can be utilized, of making a preliminary diagnosis of heart-block, which should, of course, be verified and studied in detail by graphic tracings.

The diagnosis of heart-block, even of the partial form, should not, as Dr. Hirschfelder remarks, be made without verification by simultaneous tracings of the venous and arterial pulse. It should be borne in mind, however, that partial heart-block can be produced by other lesions than degeneration of the conducting bundle of His—conditions from which complete recovery is entirely possible so that the "somberness" of the diagnosis of partial heart-block depends on its pathology. The ventricle, because of nutritional or other changes, may have its irritability so depressed that it will not regularly respond to a normal auricular impulse transmitted through a perfectly normal set of conducting fibers; or, on the other hand, an impaired tonicity of the auricle may very probably initiate an impulse so weak as to be occasionally ineffective.

We clinicians are more than grateful for the criticisms and scientific methods of the physiologists, for they have made possible the tremendous strides which have been made within the last decade in cardiac pathology and therapeutics.

A CASE OF DOUBLE PLEURISY WITH EFFUSION.

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Cases of double pleurisy with effusion are seemingly rare enough to warrant the following report:

Patient.—M. W., aged 11½, was first seen June 18, 1903.

Family History.—On the father's side this was negative. There had been several cases of pulmonary tuberculosis among the mother's sisters, one of whom was ailing at the time this child was seen. A sister of the patient had pleurisy with effusion four years before, which required early aspiration and the girl made a good recovery. One brother died at 4 years of diphtheria.

Personal History.—The girl had typhoid fever at the age of 8. Six months before the present attack she developed a rash resembling scarlet fever, which disappeared in 24 hours. The child was not very sick at the time. Ten days before I was called she came home from school with fever, headache, vomiting and nosebleed. A harsh dry cough quickly developed, which was associated with some pain through the chest and much distress. The fever continued and breathing became much embarrassed. The cough was distressing and bothered her greatly; she was unable to lie in any one position except for a short time, and had to be propped in a chair day and night. There was repeated epistaxis and much prostration.

Examination.—When first seen dyspnea was very marked, respiration was 60, temperature 102.6 F., and pulse 160. The child was cyanosed. Inspection revealed limited motion of the lower chest. There was dullness on percussion, merging into flatness, beginning at the angle of the scapula on the right side, and 1½ inches above the angle on the left side, and to about the fourth rib anteriorly on both sides. Auscultation showed harsh breathing, bronchial in character, over both sides, above the area of dullness, and over this area there was fairly distinct transmission of the bronchial respiratory sounds. The heart showed little displacement and no organic lesion. The urine was negative.

Treatment.—The left chest was aspirated June 19, giving 19 ounces of light colored fluid and on the day following aspiration of the right chest gave a little over a pint of fluid of the same character. Much relief followed the removal of the fluid, and the usual medical treatment—counter-irritation, diuretics, an occasional saline cathartic and iodine in several of its forms—was used. The thickened pleurae were rather slow in returning to normal, but under outdoor life, syrup of iodine of iron and cod liver oil, the child made a good recovery and was discharged as cured August 14. Since this time she seems healthy.

MALIGNANT TUMOR OF THE TESTICLE.

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The recent report¹ on this subject calls to mind a similar case coming under my own observation.

Patient.—J., a brakeman, applied to me, in May, 1906, for relief of what he had been told was hydrocele.

Examination.—The left testicle was found to be enlarged to the size of a lemon; it was fairly firm and not painful. Operation was advised and submitted to and the left testicle was removed and found to be carcinomatous. Recovery was uneventful and the man soon returned to work. A bad prognosis was given.

Subsequent History.—In November, 1906, the man returned for treatment and placed himself under the care of another physician, having meantime left the employ of the railroad. I was called to see the patient in consultation and found in the left hypochondrium a more or less movable mass. This had been gradually increasing in size and had been variously diagnosed, having been called among other things, a floating kidney. The man was emaciated and typically cachectic. A fatal prognosis was given in keeping with the original findings. The man insisted on an operation, which was performed; he died about ten days later. A growth involving the abdominal viscera of the left side was found, and no attempt at removal was made. The involvement was of course metastatic and although no microscopic examination was made it was undoubtedly carcinomatous, as was the testicle.

TRIPLETS WITH ONE PLACENTA.

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Parental History.—The father and mother are natives of Illinois; the father is 38 years of age and the mother 32. The mother had previously given birth to seven children, two of whom were twins.

History of Present Case.—I was called at 3 a. m., February 1. On making an examination I found the right foot presenting. The amniotic sac had not yet ruptured, so I punctured it and with the next pain the right foot descended into the vagina. Delivery was easy. After tying the cord I made an examination and found another sac presenting. In the course of 45 minutes I ruptured it and found a breech. The child was delivered, the cord tied, and another amniotic sac appeared; this I ruptured and, after 30 minutes another breech presented. This delivery was more difficult than the others.

Remarks.—A peculiar feature of the case was the fact that there were three distinct and separate amniotic sacs and only one placenta, which was delivered after the last child was born.

After the third day the mother was able to nurse all three children. The three—two boys and a girl—weighed together 20½ pounds.

1. Rolfe (W. A.): A Rare Form of Malignant Tumor of the Testicle. THE JOURNAL A. M. A., Feb. 9, 1907.